ANNUAL REPORT

OF THE

COMMITTEE

OF THE

MANCHESTER AND SALFORD

SANITARY ASSOCIATION.

BEING

A SUMMARY OF THEIR PROCEEDINGS FOR THE YEAR 1863.

APPENDICES:

NUMERICAL TESTS OF THE HEALTH OF TOWNS, REMARKS ON, BY
ARTHUR RANSOME, AND WILLIAM ROYSTON, ESQRS.
APPENDIX DO. DO. DO.
ADULTERATION OF FOOD, REPORT OF THE SUB-COMMITTEE.
HEALTH OF MANCHESTER AND SALFORD, REPORT FOR THE THIRD
QUARTER OF THE YEAR 1863, BY DR. MORGAN.
DO. DO. DO. FOURTH QUARTERLY REPORT.

MANCHESTER:
POWLSON & SONS, PRINTERS, BOW STREET, JOHN DALTON STREET.
1864.

At the ANNUAL MEETING of the Manchester and Salford Sanitary Association, held in the Town Hall, King Street, on Wednesday, 6th April, 1864 :

THE RIGHT REV. THE LORD BISHOP OF MANCHESTER IN THE CHAIR.

The Annual Report having been read;

It was moved by MALCOLM ROSS, Esq.; seconded by Sir JAMES BARDSLEY; and supported by the Rev. T. B. STEPHENSON, B.A.; and resolved :—

That this Meeting, approving of the proceedings of the Committee as stated in their Report, requests that the said Report may be printed and extensively circulated.

Moved by ROBERT GLADSTONE, Esq.; seconded by MURRAY GLADSTONE, Esq.; and resolved :—

That the best thanks of this Meeting be given to the President, Vice-Presidents, Committee, and Officers, for their services rendered to the Association during the past year, and that the following noblemen and gentlemen be requested to act as President, Vice-Presidents, Committee, and Officers for the ensuing year, with power to add to their number.—(For the names see opposite page.)

Moved by WILLIAM FAIRBAIRN, Esq., LL.D.; seconded by Dr. Noble, M.A.; and supported by the Rev. J. P. Pitcairn, M.A.; and resolved :—

That as the physical well-being of the people is directly connected with their social and national advancement, the practical efforts of the Committee to induce attention to sanitary laws deserve the encouragement and pecuniary support of this Meeting and the public generally.

Moved by THOMAS TURNER, Esq., F.L.S., F.R.C.S.; seconded by THOMAS MELLOR, Esq., F.R.C.S.; and resolved :—

That, inasmuch as one of the fundamental objects of the Association is the prevention of disease, this Meeting trusts the Committee will use every means in their power to secure all possible precautions being taken to prevent the spread of infectious disorders.

J. P. MANCHESTER.

The Chair having been taken by WILLIAM FAIRBAIRN, Esq., LL.D.,—

It was moved by Sir JAMES BARDSLEY; seconded by ERNEST REUSS, Esq.; and resolved :—

That the cordial thanks of this Meeting be given to the LORD BISHOP of MANCHESTER for presiding on this occasion, and for the interest he always evinces in the success of the Association.

J. E. MORGAN, M.B., } Hon. Secs.
C. H. KNIGHT, }

MANCHESTER AND SALFORD SANITARY ASSOCIATION.

Committee and Officers for the Year 1864.

President:

The Right Rev. The LORD BISHOP OF MANCHESTER.

Vice-Presidents:

The Worshipful the MAYOR of MANCHESTER.
The Worshipful the MAYOR of SALFORD.
The Very Rev. the DEAN of MANCHESTER.
MARQUIS of HARTINGTON.
Hon. ALGERNON EGERTON, M.P.

Sir B. HEYWOOD, Bart.
Sir E. ARMITAGE.
Sir JAS. BARDSLEY, M.D.
Rev. Canon RICHSON, M.A.
THOMAS BAZLEY, Esq., M.P.
WM. ENTWISTLE, Esq.

W. FAIRBAIRN, Esq., LL.D., F.R.S.
A. H. HEYWOOD, Esq.
W. N. MASSEY, Esq., M.P.
J. A. TURNER, Esq., M.P.
JOS. WHITWORTH, Esq., M.Inst.C.E.

Treasurer:

Mr. E. REUSS.

Chairman:

Mr. THOMAS TURNER, F.L.S., F.R.C.S.

Deputy-Chairman:

Dr. NOBLE, M.A.

Committee:

Rev. T. R. BENTLY, M.A.
Mr. Councillor BOOTH.
Mr. J. BOUTFLOWER, F.R.C.S.
Mr. GEORGE BOWRING, M.R.C.S.
Dr. HENRY BROWNE.
Dr. F. CRACE CALVERT, F.R.S.
Mr. C. E. CAWLEY, M.Inst.C.E.
Mr. Councillor CHADWICK, Ass.Inst.C.E.
Dr. J. S. FLETCHER.
Rev. W. GASKELL, M.A.
Mr. GEORGE GREAVES, M.R.C.S.
Mr. WILLIAM HEATH, M.R.C.S.

Rev. G. HUNTINGTON.
Mr. J. W. JACKSON.
Mr. Councillor KING.
Dr. LANKESTER, London.
Dr. LEDWARD.
Mr. JOHN LOWE, Jun.
Mr. T. MACKERETH, M.B., M.S.
Mr. J. W. MACLURE, F.R.G.S., F.S.S.
Mr. H. M. MACLURE.
Mr. THOMAS MELLOR, F.R.C.S.
Mr. C. O'NEILL.
Mr. WM. RADFORD, M.Inst.C.E.
Mr. J. A. RANSOME, F.R.C.S.

Mr. A. RANSOME, M.A., M.B., M.R.C.S.
Dr. WM. ROBERTS.
Dr. ROSCOE, B.A.
Mr. WM. ROYSTON.
Dr. SAMELSON.
Dr. R. A. SMITH, F.R.S.
Rev. T. B. STEPHENSON, B.A.
Mr. C. A. SWINBURNE.
Mr. J. TEALE, M.R.C.S.
Mr. G. V. VERNON, F.R.A.S.
Dr. M. A. EASON WILKINSON.
Dr. WHITEHEAD.
Mr. W. J. WILLIAMS.
Rev. F. C. WOODHOUSE.
Mr. T. WORTHINGTON.

Honorary Secretaries:

Dr. MORGAN.
Mr. C. H. KNIGHT.

SUB-COMMITTEES.

FINANCE:

Mr. WM. BOOTH.
Mr. E. REUSS, *Treasurer.*
Mr. A. RANSOME.
Mr. ROYSTON.

LECTURES:

Mr. GREAVES.
Mr. WM. HEATH.
Mr. A. RANSOME.
Mr. REUSS.
Mr. ROYSTON.

TRACT:

Rev. WM. GASKELL.
Mr. GEORGE GREAVES.
Rev. GEO. HUNTINGTON, M.A.
Rev. Canon RICHSON, M.A.
Mr. G. V. VERNON.
Mr. A. RANSOME.

REGISTRATION OF DISEASE:

Mr. GEORGE GREAVES.
Mr. WM. HEATH.
Mr. MACKERETH.
Mr. A. RANSOME.
Dr. ROBERTS.
Mr. WM. ROYSTON.
Mr. J. TEALE.
Mr. G. V. VERNON.
Dr. WHITEHEAD.

INFANT MORTALITY:

Mr. GEORGE GREAVES.
Mr. THOMAS MELLOR.
Mr. J. A. RANSOME.
Mr. A. RANSOME.
Dr. ROBERTS.
Mr. WILLIAM ROYSTON.
Dr. SAMELSON.
Mr. J. TEALE.
Dr. WHITEHEAD.
Dr. M. A. EASON WILKINSON.

ADULTERATION OF FOOD:

Mr. WILLIAM BOOTH.
Dr. CALVERT.
Mr. KING.
Mr. H. M. MACLURE.
Mr. C. O'NEILL.
Mr. A. RANSOME.
Dr. ROSCOE.
Mr. WM. ROYSTON.
Dr. A. SMITH.
Mr. C. A. SWINBURNE.
Mr. WILLIAMS.

COTTAGE DWELLINGS:

Mr. Councillor BOOTH.
Mr. JOHN LOWE.
Mr. W. RADFORD.
Mr. A. RANSOME.
Mr. ROYSTON.
Dr. SAMELSON.
Mr. W. J. WILLIAMS.
Mr. THOMAS WORTHINGTON.

The Chairman, Deputy-Chairman, and Honorary Secretaries, are, *ex-officio*, members of the above Sub-Committees.

REPORT.

In presenting to their Subscribers and the public in general a Report of their proceedings during the year 1863, the Committee rest satisfied that the questions to which their attention has been directed are such as legitimately belong to a Sanitary Association, and that they have been worked out in a manner likely to prevent the spreading of infectious diseases, diminish the tale of death, and contribute to the general well-being of the community.

In looking back to the past year, the Committee feel pleasure in expressing their opinion that, though it must be confessed the state of the public health was not generally all that might have been desired, nevertheless this result was not owing to those exceptional causes which disturbed the industrial activity in the manufacturing districts. It is true that some remarks opposed to what is here stated appeared in their First Quarterly Report; at the time, however, that Report was published the tables of the Registrar General were not yet made known. These proved convincingly that, while the rate of mortality, generally, throughout the country was unusually heavy, the North-western division of England suffered less than many other places where wages were high, and the demand for labour steady and uninterrupted.

Of the diseases which contributed to the heavy death-rate, Scarlet Fever, Small-pox, and Typhus, all played a prominent part, and caused besides a vast amount of sickness and distress. From the first of these disorders the deaths amounted in the course of the twelve months in Manchester and Salford to 1,375, and probably the seizures to about 10,000. From the second, though the fatal cases did not exceed 166, the number of sufferers, many of them disfigured for life, may be estimated at upwards of 4,000. The latter disease, indeed, threatened at one time almost indefinitely to pursue its noisome track through every corner of the town and suburbs. When, however, the danger seemed imminent, the Committee, fortified by the statistics contained in their Weekly Returns, directed their best efforts to arouse the public to a sense of their danger, and, if possible, set some limits to its further diffusion. In promoting this object they addressed themselves to the authorities, requesting them to give effect to the power the law has vested in them of enforcing vaccination, and to order with all practicable despatch the removal of affected persons from the abodes of their friends. It was in this spirit that they applied to the Boards of Guardians of Manchester, Chorlton, and Salford; and to the gentlemen who constitute those bodies their acknowledgments are due for the polite attention they bestowed on their memorials. At the same time they solicited the interference of the Watch Committee in enforcing the regulations relating to the conveyance of persons suffering from infectious diseases in carriages let out on hire. An order conformable to this suggestion was speedily promulgated among the cab drivers and omnibus conductors. The editors, also, of the more influential portion of the Manchester press were waited upon by the Honorary Secretaries, and requested to direct public attention to the precautions to be adopted. The Committee feel grateful to these gentlemen for the zealous and efficient manner in which they acceded to their wishes. And, that the reality of the danger might be rendered still more apparent, Mr. Arthur Ransome was requested to select extracts from a report on the subject of Small-pox, addressed to the General Board of Health in London by Mr. Simon, and to forward them to the daily papers. In the selected passages two points were especially insisted upon,—first, the extreme danger attending natural Small-pox; and, secondly, the highly satisfactory results which have been observed to accrue from revaccination. The salutary effect of these precautionary measures was soon seen in the abatement of the disease.

The Committee feel persuaded that the friends of the Sanitary Association will observe in the foregoing remarks a striking instance of the beneficial results likely to arise from the energetic action of a society constituted like their own. The statistics contained in their Weekly Returns supplied them at once with reliable information without which any unsupported assertions, however strenuously urged, had availed but little to stem the tide of popular apathy and neglect.

In June last the Committee, acting on a suggestion laid before them by Dr. Noble, passed a resolution requesting one of their Honorary Secretaries to draw up a weekly summary, based on the statistics contained in their return. About the same time they resolved to bring out at the end of the months of March, June, September, and December, a Quarterly Report. They believed that, in this manner, by more timely warning, the catalogue of preventible diseases might be considerably reduced; and, at the same time, the mass of valuable statistics accumulating in their returns would be turned to account, and assist in solving those obscure though doubtless not undiscoverable laws which regulate the ebb and flow of epidemic disorders.

The Committee further desire to congratulate the Association on two valuable papers, both contributed by members of their own body, and annexed to this Report. From such documents as these much valuable information respecting the state and requirements of our large towns cannot fail to be derived. The first appeared in the month of August, and was drawn up by Dr. Angus Smith; it is based on the chemical analyses of Messrs. Crace Calvert, O'Neill, Roscoe, Schunck, and Angus Smith, tabulated and arranged by Mr. O'Neill. These distinguished chemists, with a highly commendable generosity deserving the warmest acknowledgments of the Committee, devoted much valuable time to the analysing of those articles of food on which the poorer portion of the population more especially depend for their subsistence. The specimens examined were purchased by an officer of the Association in retail shops situated in the less wealthy districts of the town, and chiefly frequented by the labouring classes. The result of seventy-five analyses will be seen in the appended Report. They go to prove that, though it be true that dangerous adulteration is happily practised but rarely, nevertheless a fraudulent mixture of foreign substances, harmless indeed in themselves, is of decidedly frequent occurrence.

Another valuable paper, entitled "Fluctuations in the Death Rates of Towns," the joint production of Messrs. Arthur Ransome and William Royston, was published by the Association in the latter part of the year. The Committee would direct especial attention to the able manner in which these gentlemen criticise the different methods pursued by various investigators in their endeavours to probe the state of the public health in towns and rural districts throughout the land. In clear and forcible language they point out the fallacies which in varying degrees mar the value of the conclusions arrived at, and the many disturbing causes which render trustworthy results with such difficulty attainable.

The following Lectures have been delivered during the year :—

LECTURER.	SUBJECT.	PLACE.
T. TURNER, Esq. F.L S., F.R.C.S.	*The Connection between Food and Air, as Agents of Nutrition and Warmth*	St. Paul's School, Mulberry Street, Stretford Road.
Ditto	*The Importance of Sanitary Laws, and the Instinct of Self-preservation*	Temperance Hall, Grosve-Street, Chorlton-upon-Medlock.
Ditto	*Animal Mechanics*	Mr. Clark's Mill, Every Street, Ancoats.
Ditto	*Prevention is better than Cure*	St. Patrick's School, Livesey Street.
Ditto	*Animal Physics*	St. Michael's Institute, Hulme.
Rev. G. HUNTINGTON, M.A.	*Parental Responsibility in connection with the Physical and Moral Training of their Offspring*..........	St. Thomas's School, Ardwick.
Rev. E. B. CHALMER, M.A.	*Little Helps and Little Hindrances to Domestic Comfort*	St. Matthias' School, Broughton Road.
Rev. JAMES BARDSLEY, M.A.	*The Connection of Sanitary Arrangements with Social Comforts and Spiritual Feelings*	St. Peter's School, Fleet Street.
Dr. J. SHEPHERD FLETCHER	*Consumption,—Its Causes and Prevention*	Bennett Street School, Oldham Road.
Ditto	*Diet, Digestion, and Nutrition*	St. Matthias' School, Broughton Road.
Rev. J. DAVENPORT KELLY	*Out-door Exercises*	Bennett Street School, Oldham Road.
Dr. ALCOCK..........	*How to have Health in a Cottage*	Dr. Beard's School, Strangeways.

Lecturer.	Subject.	Place.
Dr. Ledward	*Health, the Poor Man's Wealth*	Holland Street Ragged School, and Newton and New Islington Working Men's Institute.
Arthur Ransome, Esq., M.B., M.A., Cantab., M.R.C.S.	*Bodily Strength—on what it Depends*	Infantry Barracks, Regent Road.
Dr. Roscoe, B.A., F.R.S. Professor of Chemistry, Owen's College.	*The Air we Breathe*	All Saints' School, York Street, Chorlton-upon-Medlock.
Dr. F. Grace Calvert, F.R.S.	*Water as applied to Sanitary Purposes*	Town Hall, Salford.
Rev. W. A. Darby, M.A.	*The Unity of the Human Family*	St. Matthew's School, Camp Field.
A. W. Dumville, Esq., F.R.C.S.	*Infanticide, or Child Murder*	St. Silas' School, Ashton Road.
Rev. St. Vincent Beechey, M.A.	*The Longevity of Man*	St. Phillip's School, Bradford.
Charles O'Neil, Esq., F.C.S.	*Chemistry of Animal Life*	St. John's School, Cleminson Street, Salford.
J. D. Morell, Esq.	*Health and Education*	St. John's School, Miles Platting.
Rev. T. B. Stephenson, B.A.	*Houses and Houses*	Wesleyan School, Lyon Street, Bank Meadows.

The Committee desire to return their most sincere thanks to their Chairman, Mr. Turner, and those other gentlemen who, during the past year, rendered them able assistance by the delivery of lectures. They were attended by numerous and deeply interested audiences, amounting in the aggregate to fully five thousand persons. In accordance with the expressed wish of the Committee the subjects selected especially inculcated the observance of the more important sanitary laws so often neglected yet so deeply affecting the social and physical well-being of all classes of the community.

It is agreeable to observe that, during the past year, the sale of tracts and of cards was in every way satisfactory. Inasmuch as these publications are not thrust on the public, but spontaneously sought for and purchased, such a result cannot but prove a sign of encouragement and hope.

In July last Mr. Mackereth, of Eccles, who had kindly undertaken to edit the meteorological portion of their Weekly Return, was compelled by severe indisposition to relinquish the task. At this juncture Mr. Heap obligingly consented to arrange the report of the weather. To both these gentlemen they desire to express their acknowledgments and thanks.

The Committee further deem it right to bring before the notice of their friends a project pressed on their consideration by Mr. Arthur Ransome. It concerns the establishment of an institution for the training of nurses for Manchester and the surrounding neighbourhood. It is intended that a certain proportion of these nurses shall, after suitable instruction in their duties, discharge the office of district visitors among the poor, imparting to them useful information on such subjects as the training and management of children, and the preparation and cooking of food. Viewed under this aspect, the project appears to the Committee well worthy of their fullest encouragement and support. In so far, therefore, as their influence extends, no effort will be wanting on their part which can in any way add to its success.

In the death of Mr. M. Rowland Day, the late resident medical officer of the Royal Infirmary, the Association sustained a heavy loss. During the last four years he was a constant contributor both to the meteorological and disease columns of their Weekly Return. The Committee feel satisfaction in recording their grateful recollection of the importance of the services he devoted to their cause, and their deep regret at his early and lamented decease.

Before concluding their Report, the Committee once more desire to return their most sincere and grateful thanks to the various contributors to their Weekly Returns, for the continued readiness and zeal they evince towards the Association. To many of these gentlemen, actively engaged in the labours of their profession, it must frequently prove irksome to fill up by a given day a column devoted to statistics. Nevertheless the punctuality with which the work is carried out tends to show that in Manchester, whether among the members of the medical profession, the district registrars, or those who in their love of science devote much time to meteorological observations, there exists, on the part of each and all, a strong desire to contribute according to their several opportunities to the building up and diffusion of those great sanitary laws which, in proportion as they become more widely promulgated, cannot fail to promote the health, happiness, and prosperity, of these populous centres of manufacturing industry.

The Treasurer's account of the Income and Expenditure during the year is appended, and it shows a small decrease in the Subscriptions, as compared with 1862. By exercising great carefulness, and still further reducing the number of Lectures, the Committee have kept the expenses slightly below the receipts. The balance of the Tract Fund (£31 2s. 8d.) has been transferred to the General Fund, a much larger sum having been paid out of the latter for printing of Tracts, and the result is the balance in hand is rather more than at the same period in 1862.

Ernest Reuss, Esq., *Treasurer, in Account with the Manchester and Salford Sanitary Association,*

JANUARY 1st, 1863, TO DECEMBER 31st, 1863.

Dr.

	£	s.	d.
To Balance in Bank, 31st December, 1862	31	15	5
,, ,, ,, ,, Tract Fund	31	2	8
,, Interest allowed by Bankers to 31st December 1863..	2	13	1
,, Tracts sold..................................	3	18	1
,, Subscriptions	270	6	6
	£339	15	9

Cr.

	£	s.	d.
By Rent and Taxes	37	0	0
,, Secretary's Salary	60	0	0
,, Commission allowed Collector	13	10	2
,, Expenses attending Lectures.......................	5	10	0
,, Postages	13	3	6
,, Petty Cash, including Wages of Boy	19	7	10
,, Printing	111	18	6
,, Stationery and Books..............................	4	1	2
,, Advertising	1	1	3
,, Office Furniture. &c	1	16	3
,, Balance in Bank..................................	72	7	1
	£339	15	9

Examined and found correct:

ERNEST REUSS.
WM. BOOTH.
C. H. KNIGHT.

Manchester,
December 31st, 1863.

MEMBERS FROM DONATIONS IN FORMER YEARS.

	£	s.	d.
Barbour, Robert, Esq.	10	0	0
Binyon Miss (Clifton)	5	0	0
Brooks, Samuel, Esq	5	0	0
Chadwick, R., Esq.	20	0	0
Coultate, E., Esq	5	0	0
Ellesmere, The Earl of	5	0	0
Gardner, Robert, Esq.	5	5	0
Gillibrand, P., Esq.	5	0	0
Heywood, E. S., Esq.	20	0	0
Heywood, Sir A., Bart.	5	5	0
Heywood, Arthur H., Esq.	5	0	0
Heywood, James, Esq.	5	0	0
Heywood, Oliver, Esq	15	0	0
Houldsworth, Henry, Esq.	10	0	0
Jones, R. Jennings, Esq.	5	0	0
Jones, W. C., Esq	5	0	0
Macintosh, Messrs. C. and Co	5	5	0
Manchester, The Lord Bishop of	10	0	0
Potters and Norris, Messrs.	5	5	0
Plant, James, Esq	5	0	0
Schunck, Souchay, and Co., Messrs.	5	0	0
Spafford, George, Esq.	5	5	0
Taylor, J. E., Esq	5	5	0
Todd and Coston, Messrs	5	0	0
Turner, J. Aspinall, Esq., M.P.	5	0	0
Watkin, W. B., Esq	10	0	0
Wood, W. Rayner, Esq.	5	0	0

SUBSCRIPTIONS.

	£	s.	d.
Ashton, Messrs. Samuel and Thomas	2	2	0
Ashton F., Esq	1	1	0
Atherton James, Esq	2	2	0
Atkinson F., Esq	1	1	0
Ashworth Joseph, Esq	1	1	0
Ashworth Thomas, Esq	1	1	0
Agnew Thomas, Esq	1	1	0
Atkinson and Gould, Messrs	1	1	0
Andrew Henry, Esq	1	1	0
Alcock, Misses	1	1	0
Amies Nathaniel Jones, Esq	1	1	0
Barbour, Messrs. R., and Brother	2	2	0
Brooks S., Esq	2	2	0
Barnes Robert, Esq	2	2	0
Bardsley Sir James L., M.D	1	1	0
Behrens, Messrs. S. L., and Co	2	2	0
Butterworth J., Esq	2	2	0
Bayley and Craven, Messrs	2	2	0
Bazley and Vernon, Messrs	2	2	0
Brown, Messrs. J., Son and Co	2	2	0
Butterworth and Brooks, Messrs	2	2	0
Bellhouse, Messrs. J. and W	2	2	0
Bury Henry, Esq	1	1	0
Bannerman J., Esq	1	1	0
Bannerman J. A., Esq	1	1	0
Browne Dr. Henry	1	1	0

	£	s.	d.
Brown William B., Esq	1	1	0
Booth William, Esq	1	1	0
Boutflower J., Esq	1	1	0
Barge Thomas, Esq	1	1	0
Buckley, Edmund, Esq	1	1	0
Bazley Thomas, Esq., M.P.	1	1	0
Bazley Henry, Esq	1	1	0
Binyons, Robinson, and Co., Messrs	1	1	0
Bright Messrs., and Co	1	1	0
Birks E. B., Esq	1	0	0
Barker N., Esq	0	10	6
Birch Rev. Edward, M.A	0	10	6
Bromiley Mr. Councillor	0	10	6
Bowman E., Esq	0	10	0
Booth Mr. Councillor (Salford)	0	5	0
Bolderson J. Junr, Esq	0	10	6
Carlton Messrs. J., Walker and Co	2	2	0
Carlisle Brothers, Messrs	1	0	0
Cunliffe and Sons, Messrs	1	1	0
Crewdson T. D., Esq	1	1	0
Carver, Brothers, and Co., Messrs	1	1	0
Crum, Walter, Messrs. and Co	1	1	0
Calvert Dr. F. C	1	1	0
Capes W. H., Esq	1	1	0
Carver William, Esq	1	0	0
Clarke Daniel, Esq	1	1	0
Clayton J., Esq	1	1	0
Chadwick David, Esq	1	1	0
Compton, Joseph, Esq	1	1	0
Charlewood H., Esq	1	1	0
Cooke Thomas, Esq	1	1	0
Collins Edward, Esq	1	1	0
Chadwick John, Esq	0	10	6
Cawley C. E., Esq	1	1	0
Dugdale Messrs. John, and Brothers	1	1	0
D'Hauregard Messrs., H., and Co	1	1	0

	£	s.	d.
Entwistle William, Esq	2	2	0
Elce Messrs. John, and Co	1	1	0
Fletcher Messrs., Son, and Co	2	2	0
Farbridge and Holliday, Messrs	1	1	0
Findlater and Mackie, Messrs	1	1	0
Fairbairn William, Esq	1	1	0
Franklin J. A., Esq	0	10	6
Fryer, Benson, and Forster, Messrs	1	1	0
Franks Abraham, Esq	0	10	6
Fullarton John Alexander, Esq	1	1	0
Gladstone Robert, Esq	2	2	0
Gardner Robert, Esq	2	2	0
Greg Messrs. R. H., and Co	2	2	0
Galloway Messrs. W. and J	2	2	0
Graham Messrs. William, and Co	1	1	0
Galloway Messrs. J., and Co	1	1	0
Grover J. D. K., Esq	1	1	0
Gaskell Rev. William	1	1	0
Gladstone Murray, Esq	1	1	0
Gibb William, Esq	1	1	0
Gibson Rev. Canon	1	1	0
Greaves George, Esq	0	10	6
Harter William, Esq	2	2	0
Heywood Arthur H., Esq	2	2	0
Heywood Sir Benjamin, Bart	2	2	0
Heywood E. S., Esq	2	2	0
Heywood Oliver, Esq	2	2	0
Hunter Thomas, Esq	2	2	0
Hickson, Lloyd, and King, Messrs	1	1	0
Houldsworth H., Esq	2	0	0
Houldsworth Messrs. J., and Co	1	1	0
Harrison Dr. G. Morley	0	10	6
Ireland Messrs. Alexander, and Co	1	1	0

	£	s.	d.
Jackson Messrs. E. and J	1	1	0
Jewsbury and Crux, Messrs	1	1	0
Jackson J. W., Esq	1	0	0
Jackson H. B., Esq	0	10	6
Joule Dr. J. P	0	10	6
James and Chabot, Messrs	1	1	0
Kershaw, Sidebottom, and Co., Messrs	2	2	0
Kipping J. S., Esq	1	1	0
Kipping J., Jun., Esq	0	5	0
Keighley J., Esq	1	1	0
Kingsley John, Esq	0	10	0
Lucas Philip, Esq	2	2	0
Langton William, Esq	2	2	0
Leissler John, Esq	2	2	0
Langworthy, Brothers, and Co., Messrs	1	1	0
Lyon Messrs. Edward, and Brother	1	1	0
Le Mare E. R., Esq	1	1	0
Lee Messrs. Daniel, and Co	2	2	0
Lund Edward, Esq	1	1	0
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MANCHESTER AND SALFORD SANITARY ASSOCIATION.

REMARKS

ON SOME OF THE

Numerical Tests of the Health of Towns.

BY

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AND

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REMARKS

ON SOME OF THE

NUMERICAL TESTS OF THE HEALTH OF TOWNS.

It is the object of the present paper to examine the efficiency of some of the numerical tests of the health of towns, and to consider how far they will legitimately yield the inferences which have been drawn from them.

Most of these tests have been devised in order to guide those who are endeavouring by sanitary measures to raise the general standard of health of the inhabitants, and they have therefore been chiefly directed towards two ends:—1. To give a distinct and accurate account of the diseases and deaths occurring in various places; 2. To indicate the causes or influences by which these evils have been produced.

The first of these aids is essential to the sanitary reformer, both as a guide to the points where his help is most needed, and as a test of the efficacy of his measures. The second is equally important, since, before he can apply any remedy, he must know how the mischief has arisen.

In any enquiry into the health of towns these two objects should be kept carefully distinct. Without, therefore, in any way prejudging the question as to the origin of any excessive mortality, we will now examine some of the methods which have been used to ascertain the relative amount of disease and death prevailing in different places.

Since the year 1837, through the labours of the Registrar General and his staff, we have had a complete record of all the births and deaths which take place in this country. From these returns various methods of estimating the public health have been adopted :—

1. *The National System of Computation.*

This, which may be called the national system, was introduced by the Registrar General himself, and the striking results from it, which were published in his Sixteenth Annual Report, probably gave the first great impetus to sanitary effort.

By calculating the average number of deaths which occur in each town or district of the land for every thousand of its population the Registrar General obtained a series of figures which, varying from 15 to 36, he designated the " death-rates " respectively of the places for which they were received.

By means of these figures we could at once see the amount of mortality occurring in any particular place, and compare it in this respect with other places; or mark how far it departs from any ideal standard of health which we might have fixed upon.

At first sight it seems as if we had now gained all that we could desire, and many writers on sanitary subjects have assumed that with these numbers they could measure the health of various towns, as readily as they could by the thermometer ascertain their mean range of temperature.

So far, however, from being thus simple, the problem is one of a most complex nature, as we shall now endeavour to show.

There is one chief reason why we cannot, without further investigation, appeal simply to the death-rates of different places as tokens of their relative rank in the scale of health.—These places are not in the same position as regards the character of their population.

We will not now discuss the influence of particular employments, which more or less affect the public health in different localities, there is, however, another agency very frequently and actively at work, which introduces serious errors into any calculations based upon the gross rate of mortality.

This disturbing element is to be found in the migratory character of a large part of the population of our large towns,—and it interferes with our calculations, both by altering the numerical proportions of the population at different ages,—and by assigning the origin of diseases to the wrong sources.

It is difficult for any one not acquainted with the fluctuating character of the population of large towns, to realize the extent of the migration that is continually taking place; the manufacturing towns are, in fact, constantly fed by immigrants from the healthy rural districts, and if it were not for this advantage, some of the most densely crowded towns would now be diminishing instead of increasing in numbers. It has been calculated by the Registrar General that the death-rate of Liverpool is lessened, from this cause alone, to the extent of six annual deaths per thousand.

The following table shows the proportion between the number of persons of various ages, at a country town, Brampton, and at Manchester:—

TABLE I.

Showing the per-centage of the population at the following ages, in Brampton and Manchester. The population used is that of 1851, and the deaths the average of the years 1850, 1851 and 1852.

	Under 15 years.	15 to 35 years.	35 to 55 years.	Above 55 years.
Brampton. Population 11,323	36·39	32·30	19·39	11·92
Manchester. Population 228,433	33·16	38·48	21·26	7·10

It will be seen that the per centage of persons under 15 is greater at Brampton than at Manchester; between 15 and 35 years of age, there are proportionately many more inhabitants in Manchester than in Brampton; from 35 to 55 the numbers are more equal, but from 55 and upwards Brampton again has the advantage.

This shows plainly that whilst from some cause Brampton is drained of its population between the ages of 15 and 35,—Manchester receives a large influx of persons at these ages.

Manufacturing towns will be most affected by this source of error, the migration to these centres of industry is much greater than to other places, and their death-rate is lessened in consequence; and therefore, any estimate of the healthiness of such places, based simply upon the gross rate of mortality, must be erroneous.

In the absence of any system of registration of immigrants, such as is practised abroad, it is impossible to obtain an accurate statement of the amount of fluctuation of population which is going on,—we must, therefore, seek for some other means of eliminating the errors which it introduces into the ordinary system of estimating the mortality of towns.

2. *Separation of the Mortality at different Ages.*

In a paper on the "Variation of the Death-rate in England," read before this Committee in 1860, instead of taking the gross mortality of a place and comparing it with the total population,—it was proposed to ascertain the number of deaths occurring at the various periods of life, and to compare these with the population then living at the same ages. In this way those ages most affected by the influence of migration are separated from the rest, and a more accurate comparison can be made between the mortality of different places.

For the purpose of testing this plan, the following table has been prepared. It shows the number of deaths which occur at Brampton and Manchester at the different periods of life. These deaths are estimated for every thousand of the population living at the several ages, and thus the deaths at each age are compared with the population at the same ages.

TABLE II.

The deaths at the following ages, for every 1,000 of the population at the same ages, at Brampton and Manchester:—

Towns.	Under 15 years.	15 to 35 years.	35 to 55 years.	Above 55 years.
Brampton	17·8	6·8	10·8	51·6
Manchester	47·5	9·9	23·3	86·2

The results are sufficiently striking. The ages least affected by the migration of the population, namely, from infancy to fifteen years, show the greatest difference in their rates of mortality; whilst those ages (from fifteen to thirty-five) which are most affected by this cause show its influence in an apparent approximation of the respective death-rates of the two places. When this table is compared with Table I., it can scarcely be doubted that the apparently small difference between the death-rates of the ages from fifteen to thirty-five years is caused by the influx of healthy lives into Manchester from such places as Brampton.

The method employed by the Registrar General is sufficient for ordinary purposes,—it will give the gross number of deaths occurring in any one town, and it will test roughly the progress made in the sanitary condition of the inhabitants; but when it is desired to contrast this town with others, greater exactness is needed, and we have to take into account the variation produced in the rate of mortality by the fluctuating character of the population.

Whenever great accuracy is required, therefore, in comparing the mortality of different places, we propose to cut off entirely from the calculation, those ages which are chiefly affected by migration, and to compare only the deaths under fifteen years of age.

Table III. gives the mortality under fifteen years of age for every thousand of the population under that age in the following towns. We would especially call attention to the low death-rates at these ages in the cities and country towns of Stafford, Lancaster, York, and Altrincham, as compared with those of Liverpool, Manchester, Sheffield, and Wolverhampton.

TABLE III.

UNIONS.	Population under 15 years 1861.	Deaths under 15 years 1861.	Rate per 1,000
Eastbourne	3,969	66	16·8
Stafford	8,221	162	19·7
Lancaster	12,686	270	21·2
Altrincham	14,251	349	24·4
Birmingham	87,533	2,249	26·7
Carlisle	15,813	492	31·1
York	19,925	624	31·3
Wolverhampton.........	48,918	1,618	33·0
Exeter	10,678	357	33·4
St. George (H. S.)......	22,217	816	36·7
Sheffield	48,320	1,918	39·6
St. George (East)	17,044	701	41·1
St. Giles	15,643	714	45·6
Preston	38,467	1,797	46·7
Manchester	83,038	3,946	47·5
Liverpool	87,774	4,689	53·4

3. *The* $\frac{Death}{Birth}$ *Method.*

Another method of computing the death-rate of towns has recently been applied by Dr. Whitehead.* The result of his calculations is much more favourable to our city than that arrived at by the Registrar General. It, therefore, becomes very necessary that the mode of computation employed should be carefully examined.

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* The Rate of Mortality in Manchester, by James Whitehead, M.D. 1863.

According to this method the number of deaths for every hundred births is assumed to be the "death-rate," and the proportion of deaths to births is made to measure the salubrity of places. Thus the figures in the following table are supposed to represent the healthiness of the places to which they belong :—

TABLE IV.

Number of deaths to every 100 births at the following places :—

Manufacturing Towns	$\frac{\text{Death}}{\text{Birth}}$ rate.	County Towns	$\frac{\text{Death}}{\text{Birth}}$ rate.
Sheffield...............	73·15	York	74·00
Wolverhampton......	67·19	Stafford	83·39
Manchester	72·71	Lancaster	81·00

This method appears to us to be founded upon an entirely fallacious basis; it takes for granted that the rate of increase is a fair test of salubrity; it compares the number of deaths with that of births, a standard constantly varying from causes independent of sanitary conditions: it avoids none of the errors belonging to other modes of calculation, and it imports several of its own.

1. The rate of increase from the excess of births over deaths is not a fair test of salubrity, even supposing the error from emigration and immigration eliminated. A very healthy place may remain, through a series of years, perfectly stationary as to population; through various causes not connected with salubrity the birth-rate may be equal or inferior to the death-rate—as is the case in many parts of France; such a place, however, would be immediately condemned by the mode of calculation which we are considering. If from any cause, economic or moral, the number of births should merely equal the number of deaths, a place might be most healthy, all the inhabitants might live to the age of 70, or even 100; and yet, according to this method of computation, it must be written down as most insalubrious,—it would have a rate of mortality of 100 or 24 per cent. worse than Manchester, with its $\frac{\text{death}}{\text{birth}}$ rate of 76.

2. In the $\frac{\text{death}}{\text{birth}}$ method, the standard of comparison chosen is itself variable, and has no necessary connection with the sanitary condition of a place.

The following table shows how greatly the birth-rate varies, even in the several districts of Manchester :—

TABLE V.

Showing the number of births per 1,000 in the following districts of Manchester :—

Chorlton…………	34	per 1,000	St. George's ……	40	per 1,000
London Road …	36	do.	Hulme …………	42	do.
Deansgate ……			Ardwick ………	43	do.
Ancoats …………	39	do.			

If we take the birth-rates of different towns, as shown in Table vi., the contrast is still more striking.

When the health-rate is obtained by dividing the deaths by the births, it is evident that an increase in the number of births will materially affect the result by increasing the denominator of the expression, and thus, wherever, from any cause the per centage of births to the population is greatest, there, cœteris paribus, the $\frac{\text{death}}{\text{birth}}$ rate will be less than it ought to be.

In proof of this, let us take an example :—In Ardwick, to every 1,000 of the population, there are 24 deaths ; and in Chorlton, there are 19, showing a difference of 25 per cent. in their true rate of mortality ; by the $\frac{\text{death}}{\text{birth}}$ rate, however, they are nearly equal, the deaths being respectively 56 and 57 to every hundred births.

The reason of this difference becomes at once apparent, when we find that the respective birth-rates of the two places are,—Ardwick 43, and Chorlton 33.

Without enumerating other causes of variation, economical, moral, or physiological, it is certain that the number of births depends in part upon the number of marriages, and this again upon the proportion of individuals who are of marriageable ages—upon the condition of trade—the plenty or scarcity of the necessaries of life.

For these reasons manufacturing towns naturally show a more rapid rate of increase by means of births than either cities or country towns.

The following table shows the marriage rates for every thousand of the population in three manufacturing unions and three county unions or cities. It is interesting to compare with these marriage rates the number of births, and the rates of increase as shown by the $\frac{\text{death}}{\text{birth}}$ method, and to notice the relation existing between the different sets of figures:—

TABLE VI.

	Towns.	Population in 1861.	Marriags per 1,000	Births per 1,000	Deaths per 1,000	$\frac{\text{Death}}{\text{Birth}}$ rate
Cities and County Unions.	York	59,909	9·73	33·4	24·0	74·00
	Lancaster	35,297	7·22	32·7	21·8	81·00
	Stafford	24,475	7·09	29·2	20·7	83·39
Manufacturing Unions.	Manchester	243,988	18·11	38·1	30·4	72·71
	Sheffield	128,951	13·13	41·4	26·2	73·15
	Wolverhampton	126,902	7·24	40·5	21·8	67·19

Wolverhampton seems to be an exception to the rule that the number of births are proportionate to the marriage rates, but its $\frac{\text{death}}{\text{birth}}$ rate shows the influence of its large birth-rate, which exceeds even that of Manchester, notwithstanding the small relative marriage rate of Wolverhampton.

These circumstances explain the relative salubrity of large manufacturing towns, from this mode of reckoning. The frequency of marriages and births in these hives of industry, causes the $\frac{\text{death}}{\text{birth}}$ rate to be small; and thus those places which are really most unhealthy are made to appear to great advantage by the side of quiet country towns, where there is less marrying and giving in marriage, and where consequently there are fewer births.

We thus see that this novel mode of computing the health-rate of towns, not only gives an incorrect view of the comparative rate of mortality, but it exaggerates the errors due to immigration and migration.

4. *Average Duration of Life.*

It has been proposed to estimate the relative healthiness of towns, by comparing the average age at death of their respective populations.

The returns of the Registrar General give the age of each person at the time of his death, and thus furnish the materials for this calculation.

It will be evident, however, that all the errors due to immigration will be retained and even magnified by this method, since the ages at death of all new comers will be included amongst the other deaths.

An extreme example will show how fallacious this mode of calculation would be. An unhealthy military station—like Sierra Leone for example—might have its garrison constantly renewed by the arrival of fresh troops from England. These men might be killed off in a short time by the action of the deadly climate, and yet, since the ages of these soldiers would not be less than twenty to thirty years, the average age at death would be very high, and would consequently indicate a very healthy condition. Something of this kind must always be the case with immigrants into unhealthy towns.

We believe, therefore, that of the various tests which we have examined, the second alone can be relied upon to give trustworthy results. By calculating the mortality of that portion of the population which is unaffected by migration we have a fair standard by which towns can be compared one with another and ranked in the scale of health. At the same time, however, we would repeat that, whilst we choose this as a means of comparison, we do not entirely throw aside the other methods which we have reviewed, only they must not be burdened with more inferences than they will safely carry.

The $\frac{\text{death}}{\text{birth}}$ rate, when compared with the Registrar General's gross rate of mortality, shows the speed at which large towns are increasing, in spite of the enormous number of deaths; and the average duration of life, when employed in the same way, gives us some idea of the classes of the population amongst whom deaths are most frequent.

The Causes of Death.

We may turn now to the second branch of the subject, and ask what help is afforded by the figures which we have obtained to guide us to the causes of the mortality of these places.

It has been the habit with certain writers on sanitary subjects to assume at once that the greater part if not the whole of the excessive mortality of large towns is due to want of proper sanitary conditions; and hence, without further investigation, a high death-rate has been held to imply an urgent need for physical sanitary reform; this once accomplished it is supposed that the mortality would immediately sink to a normal standard.

The ambiguity of the phrase—"the unhealthiness of a place," lends itself readily to such an assumption,—at one time meaning simply that there is a high rate of mortality there,—at another being intended to designate the condition of the town with respect to climate, drainage, or other sanitary conditions. Thus it is easy to mingle the two meanings, and to take it for granted that a high death-rate is purely the result of defective sanitary regulations.

Unfortunately the case is not thus simple,—we must, in fact, group roughly all the preventible deaths occurring in our large towns in two great divisions.

First.—Those which arise from defective sanitary arrangements, or from the essential physical insalubrity of the places themselves.

Second.—Those which are produced by the so-called moral causes from want of proper management of health on the part of the inhabitants themselves.

It is with the first of these sets of causes that the legislature and municipal authorities have to deal. We do not need now to enlarge upon their injurious action. Their effects, if not sufficiently guarded against, are at least tolerably well known,—bad drainage, air charged with noxious exhalations, crowded and ill-ventilated dwellings, unwholesome food or drink,—all these work their evil influence, not so much perhaps by producing actual disease, as by gradually bringing about that condition of low vitality which surely prepares the way for more active destroying agents.

We have to do with much more subtle causes of disease, and they must be sought for rather in the character of the inhabitants themselves than in the physical imperfections of the town.

We find but little indication of these causes in the tables of disease given by the Registrar General. From his annual return we could reckon the number of deaths which have been ascribed to various diseases, and those which had a specific origin, such as the numerous epidemic and syphilitic diseases, we might at once set aside as having no necessary connection with ordinary sanitary conditions. A pathologist might learn from them the number of times this or that organ of the body had been, or had seemed to be, the part chiefly affected at the time of death, and he might glean from them interesting facts bearing upon the history of disease, but this would be almost the sum of assistance to be gained by their study. The diseases of the liver would not tell of the intemperance by which they were for the most part occasioned,—the cases of infantile pneumonia would not accuse the parents of that careless exposure of their offspring by which they were probably produced.

If we want to track a large proportion of these deaths to their true sources, they must be sought for in the districts where they are most frequent,—in the back streets and crowded alleys of our manufacturing towns. And they do not lie far out of sight; we can readily enumerate the most common of the causes of disease and death, which are to be found at work in these places.

First, perhaps, must be named intemperance, not only as itself the cause of many diseases, but as a sure guide to all those which follow,—afterwards, in order, we might mention, the gross impurity of living, which has tainted the source of life at its origin, and which transmits hopeless disease as a heritage; the irregular habits which have cast an undue strain upon some one organ of the body; the unwholesome or improper food or drink, which have set wrong some of the many processes of nutrition; the toil unsuited to the age or strength of the worker; the daily struggle for existence, rendered all the more anxious, and weighing down the spirits and vital forces all the more heavily, from the want of providence for the future; the ignorance or neglect of the plainest laws of health, causing a want of cleanliness, or of any care for the body, and leading to reckless exposure to cold, damp or other noxious influences; over-crowding with all its train of evils; last, but chief cause of all, the want of care and want of knowledge of parents in the management of their children.

This is a list of some of the chief causes of death at work in our moral wastes, and yet, not one of them has any necessary connection with the sanitary condition of a place; scarcely one, which might not work its evil way as powerfully in the most salubrious as in the most unhealthy districts. It is the vast influence of these so-called moral causes of disease that should prevent us from drawing any conclusion respecting the physical sanitary condition of a place, simply from the magnitude of its death-rate. Our numerical tests cannot do away with the necessity for careful inquiry after the true sources of excessive mortality,—these must be sought in the habits of the people no less than in defective sanitary regulations

Note.—The following extract taken from the last Report of this association illustrates this conclusion very strikingly:—

“The condition of the streets in which the largest mortality occurred was then inquired into, but it was soon found that no valid conclusions could be drawn from a mere tabular statement respecting places in which the per centage of population at the various ages is not equal. The old streets are often inhabited by elderly people with grown-up families; the new chiefly by newly married couples, with increasing families. It was therefore resolved that several of the streets should be visited by members of the Committee, and inquiry made as to their condition and that of the inhabitants. Accordingly, several of the streets in New Cross Ward, Ancoats, were visited by Mr. J. A. Ransome and Mr. Royston, and a report presented to the Committee. These gentlemen found but little fault with the modern dwellings, but the houses forming the old streets were often in a very unhealthy condition,—the back passages and offices of these buildings being in many instances in a disgraceful state. It seemed probable, however, that the sanitary condition of the streets, so far as regards drainage and cleanliness, had less influence upon the health of the inhabitants than some other causes, and in support of this suspicion, the following table, presented by Mr. Royston, respecting two of the streets visited, shows that the mortality in the old streets was actually less than that in the new, and it also points out that this excess of mortality is due to the deaths of children—the birth-rate is greatest in the new streets, and the mortality is correspondingly large.

Deaths in 1859.

STREET.	Houses.	Populatn.	Deaths.	Rate per 1000	Deaths under 5 years	Rate per 1000	Deaths above 5 years	Rate per 000	Births in 1859	Rate per 1000
*Primrose-street. (old)	93	605	17	28	8	13	9	15	17	28
‡Cobden-street.. (new)	166	870	27	31	16	18	11	13	40	46

*16 Cellars.—6½ ⅌ House. ‡ No Cellars.—5¼ ⅌ House. 1861.

The larger number of deaths in particular streets, therefore, was no good guide in searching for special causes of unhealthiness, and after much consideration the Sub-Committee came to the conclusion that the chief causes of the large infant mortality of Manchester are want of knowledge and want of care in the management of children by their parents. It was resolved to attempt to meet these evils by issuing cards giving plain instructions to the parents in the subjects of “Food for Infants,” “Clothing and Cleanliness,” and on “Nursing Sick Children.

From the first this Association has fully recognised both the great groups of influences which we have mentioned as causes of the enormous preventible mortality of large towns. It has not only earnestly pushed forward all worthy schemes of sanitary reform, but it has also endeavoured to instruct the poor of this city in the laws of health,—both by the lectures regularly delivered each winter under its management, and by tracts, cards, and other publications constantly urging upon them the importance of temperance, cleanliness, and attention to the rules of health.

It has still a vast force both of physical and moral evil to contend against. There is still room for efficient legislative interference,—there is need both for the engineer and for the authority of the law, but, most of all, is there work for the sanitary missionary.

Overcrowding.

We have mentioned overcrowding among the other influences predisposing to disease.

The Registrar General has shown that the rate of mortality bears a close proportion to the density of the population, but this fact has recently been called into question in Dr. Whitehead's pamphlet already alluded to. There are, in fact, two modes by which the amount of crowding may be estimated,—one by calculating the number of persons to the acre — the other by noting the number of inhabitants to each house.

Now it is the excessive crowding of people in the same house from which we should expect injurious effects, and it is only by the second method that we can obtain an accurate idea of the extent to which this prevails. It is quite possible that a large number of persons might live in health, and without overcrowding upon a comparatively small area; or again, owing to the encroachment of other buildings, the inhabitants may be sparsely scattered over a large space, and yet the few dwelling houses remaining may be greatly over-crowded. The following table clearly shows that in the district of Manchester, therein displayed, the rate of mortality does not vary as the estimated average density,—but as the number of inhabitants per house.

TABLE VII.

Table, showing the acreage density of the population, the number of inhabitants per house, and the death-rate per 10,000 of the population, in the following districts of Manchester :—

DISTRICTS.	Population in 1861.	Estimated acreage density.	Average No. of Inhabitants per house.	Death-rate per 10,000 of Population.
St. George's ... Ancoats	104,038	19,796	5·6	280
London Road ... Deansgate ...... Market Street...	81,372	13,756	6·0	294

In truth it is not so much from the over-crowding itself as from the circumstances which accompany it that so many evils result from it.

The people who thus flock together most closely, are the poorest and most degraded of the population. They are driven by penury or by choice to the lowest parts of the town, generally to those parts which have been abandoned by all others from their proximity to the river, or to the various nuisances of a large town. They are thus left without the leaven of example to improve their condition, and become fit food for disease and vice.

These people are of that class, amongst which, we should be most likely to meet with all the evil influence, above mentioned, most actively at work. Amongst them we find intemperance, immorality, improvidence, neglect of the body, utter carelessness and ignorance of all the laws of health,—it is not surprising that amongst them death claims so large a proportion of victims.

CONCLUSIONS.

As the result of our enquiry therefore, we conclude,—

1. That the migration of persons from healthy districts into large towns, alters materially the proportions of the inhabitants at the

several periods of life, and causes an important variation in the death-rate.

2. That this variation, not being due to causes connected with disease, prevents any determination of the health of towns by a mere comparison of their respective death-rates.

3. That to obtain a typical representation of the mortality occurring amongst the fixed population of large towns, the deaths at those ages most affected by the fluctuation of the population must be separated from those which take place at an earlier period of life.

4. That the proportion which the number of births bears to the number of deaths, happening in any community, is no test of the healthiness of that place.

5. That the average age at death, in any town, is not a fair test of its salubrity.

6. That preventible deaths are not alone caused by defective sanitary conditions, but frequently, also, by want of knowledge and want of care on the part of the inhabitants.

7. That no conclusion, therefore, can be drawn respecting the sanitary condition of a town from a mere inspection of its rate of mortality.

8. That the instruction of the public, and especially of the poor in matters relating to health, is as important as the prosecution of sanitary reform by legislative and mechanical means.

Powlson & Sons, Printers, Bow Street, John Dalton Street.

APPENDIX.

Since the publication of this paper another edition of Dr. Whitehead's work has appeared, containing an explanation of his method of computing the death-rate. Upon this explanation we desire to make some further remarks,—first, however, noting that it leaves untouched the arguments which we have adduced against it.

First.—In the preface to this edition, and at page 46, an attempt is made to prove that the $\frac{\text{death}}{\text{birth}}$ method avoids the errors due to migration, as follows:—Certain towns are selected (Howden and Canterbury, Exeter and Ely), and the amount of migration affecting the populations of these places is calculated; the numbers obtained are then added to or subtracted from the actual population, so as to produce a non-fluctuating standard. The average number of annual deaths is then compared with this population, and the result is found to tally much more closely with the $\frac{\text{death}}{\text{birth}}$ rate than with the Registrar General's return. In this calculation, however, a strange omission has been made; the numbers of the migrants have been used to correct the populations, but no account whatever has been taken of the births and deaths which must have happened amongst them; and thus, in one case, immigrants are deducted from a population, and yet their deaths are left to swell the apparent death-rate; and, in another, emigrants are added to a population, without any addition being made to the number of deaths on account of the mortality which must have taken place amongst them.

If so erroneous a calculation produces results similar to the $\frac{\text{death}}{\text{birth}}$ rate, there needs no other proof of the faulty nature of this method of procedure.

Second.—Dr. Whitehead argues that the greater the excess of births over deaths, the more healthy is the place; and further, at page x. of the preface, and at page 65, he assumes that this excess of births over deaths gives the number of children who have been "safely reared through the casualties and destructive maladies of early age to maturity." We would simply refer to page 9 of our paper for a refutation of this doctrine.

Perhaps the fallacy of the $\frac{\text{death}}{\text{birth}}$ method cannot be better illustrated than by supposing a case, which is very little removed from many real ones: Two towns, each having a population of 10,000 souls, have, occurring amongst them during the same year, an equal number of deaths—240 for example. According to the national mode of calculation the rate of mortality would thus be the same in both places, but by the $\frac{\text{death}}{\text{birth}}$ method the death-rates will only prove equal if the number of births in each place are equal. Now we know that the birth rate varies considerably from causes quite unconnected with disease or death, and hence we might suppose that in one of these places only 300 children were born in the course of the year, whilst in the other 400 were produced. If this were so, then, by the $\frac{\text{death}}{\text{birth}}$ plan, the mortality in one place would be represented by 60, in the other by 80, or one-third more in one case than the other. A result, be it observed, wholly independent of sanitary conditions.

POWLSON AND SONS, PRINTERS, BOW STREET, JOHN DALTON STREET.

MANCHESTER AND SALFORD

SANITARY ASSOCIATION.

REPORT

OF THE

SUB-COMMITTEE

UPON THE

ADULTERATION OF FOOD.

MANCHESTER:
POWLSON & SONS, PRINTERS, BOW STREET.
1863.

SUB-COMMITTEE

ON

ADULTERATION OF FOOD.

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Dr. F. CRACE CALVERT,
Mr. GEORGE GREAVES,
Mr. Councillor KING,
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REPORT

OF

THE SUB-COMMITTEE

ON THE

ADULTERATION OF FOOD.

As several towns, including the metropolis, have taken advantage of the permission of the legislature to appoint a public analyst of substances used as food, it seemed to the members of the Manchester and Salford Sanitary Association that it might fairly be expected of them to enquire into the necessity of appointing such an officer for the protection of this population. Five chemists were requested to analyse certain specimens, which were bought for them by an officer of the Society. Purchases were made only from the inferior class of shops, but none of the names of the dealers were known or are even now known to the chemists who made the analyses. The object of the Society was not to detect the faults of individuals, but to ascertain the quality of the usual food of the poorer part of the inhabitants. The results were sent to the Association without remarks in nearly all cases, and Mr. O'Neill has collected them in a tabular form. I happened to send a short report, and, probably for that reason, have been requested to write one for the Association, grounded mainly of course on the analyses sent in. I say for that reason, because I have not made the subject a speciality, although a few details relating to it have been gradually accumulating during my stay in Manchester, and few chemists are permitted entirely to neglect it.

Flour.—The first specimen examined was flour. All agree in looking on this substance as in every case unadulterated. The specimen examined by Dr. Roscoe contained from one to two per cent of ash; but this was most probably intended for a brownish quality of bread. The specimen of flour examined by me contained 0·74 of ash and was seconds flour. It was of course carefully examined for alum but it contained none whatever.

I have lately had occasion to examine several other specimens of flour for a public purpose, and in few of them have I found alum. At first every one appeared to contain it, as a large amount of sulphuric acid was readily found; but, after a careful search, trying every method hitherto used, it was proved that the acid only was present, and not the alumina generally. These flours were obtained under the suspicion of being adulterated with alum. The addition of sulphuric acid to the wheat before grinding seems largely to have taken the place of alum itself; and if it answers the ends desired—the prevention of further decay, it will be a valuable agent which can scarcely be suspected of doing any injury to counterbalance its services. The amount of sulphuric acid found is exactly the same as would exist in the amount of alum usually employed. If this has been obtained by experience, it is rather a singular circumstance.

Bread.—Three of the specimens contained alum, and two were free from it. The amount generally found is fourteen grains per pound of bread. These results speak in favour of the flour dealers and against the bakers, and we can readily imagine that the baker comes into the closest contact with any quality of the flour that may be prejudicial to bread making. The alum is added to facilitate the rising or fermentation, and the union of the gluten with water. It is however used also for the purpose of preserving the whiteness of the bread ; this points rather to a *colytic* action of the alum, a power restraining decomposition. We know that alum has this preserving action ; and, still more so, the poisonous salt sulphate of copper, which was formerly used for the same purpose.

Now Liebig has shown that a result similar to that caused by alum is obtained by the use of lime-water. It does not appear that the observations made by Liebig have met with due attention in this country. It has been objected to the plan that, although some of the advantages obtainable from alum are obtainable from lime, the increased whiteness is not one ; but I am not aware of an extensive set of trials on this subject. If it be that the alum acts at a certain point by restraining the decomposition, and that the lime does not, we may perhaps obtain the same result by using lime and stopping the action of the fire at an earlier period, or by some other method to be found on enquiry. The whole subject is one affecting the most pressing wants of mankind, and all chemists must take their share of blame until it is made perfectly clear to the intelligence of persons of a very small amount of education. Until this be done we, the chemists, are more to blame than even the bakers of alumed bread ; they solve the problem in the way best known to them,—we do nothing. We must however make Liebig and Dr. Dauglish exceptions. It may be advisable, on some occasions, to procure a satisfactory food for the people by threatening the dealers with the terrors of the civil law, but it is much more desirable to reach the same goal by the milder influences of natural law, as it is developed by science. This is the same as saying that chemistry will cure the evil better than the policeman, or that nature has more help in her than imperial parliament.

Professor Liebig's substitute for alum in bread.—" The action of both substances (sulphate of copper and alum) in the preparation of bread depends on their forming by heat a chemical compound with the altered and soluble gluten, by which the latter recovers all its lost properties of insolubility and its power to unite with water.

"The many properties possessed by the gluten of the cereals, in common with caseine, induced me to make some experiments with the object of replacing these two dangerous compounds by some other harmless substance with similar action; this substance is pure cold saturated *lime-water.* If the portion of the flour destined for the dough be made up with lime-water, and the yeast then added, and the whole left for some time, fermentation takes place just as if no lime-water had been used. On adding, at the proper time, the rest of the flour to the fermented dough, forming the loaf and baking as usual, there is obtained a beautiful, solid, elastic, highly porous bread, free from acidity and moisture, of most excellent flavour, and which is preferred to all others by those who have eaten it for some time. The proportion of flour to lime-water is 19 to 5: that is 100 lbs. of flour require 26 to 27 lbs. of lime-water. This quantity of lime-water is sufficient for the formation of the dough; common water must therefore be afterwards added in the proper proportions. (Lime-water is prepared by simply mixing freshly slacked lime with water, and letting it stand till it becomes clear: this is saturated water.") The exact amount of lime water is given here by Liebig; an experienced baker will know from the consistence of the dough if any more liquid is required, in which case ordinary water must be added; according as the acidity of the bread disappears salt must be increased to render it palatable.

"With regard to the quantity of lime in the bread we know that one pound of lime is sufficient for 600 lbs. of lime-water; if, therefore, the bread be made with the above proportions, the amount of lime will be nearly the same as in an equal weight of the leguminous seeds."

He also adds that the lime enables the bread to take up water to a greater extent, although it does not appear that this is a very valuable property when driven far.

Before leaving the subject, it may be remarked that no bread can be expected to be pure, in a refined sense, unless machine-made, and why that is so rare it is difficult to tell, considering that we live among such an enterprising generation. Dr. Dauglish informs me that when his process of making bread is used, i. e. machine-made and ærated bread, "not only does it do away with the necessity to use alum, but the bread made with the soft and unstable flour prepared from soft English wheat is actually more pleasant to the taste and otherwise much better than when the expensive foreign wheats are used. Likewise the bread made from flour in which all the 'fine middlings' are retained is also more palatable and better, and I need not tell you far more nutritious than when the fine middlings are dressed out, which is always done for fermented bread making." He also says that, with his process, "alum is absolutely prejudicial," and "even flour which is harvested in bad weather makes a most delicious bread, without any addition of alum."

Oatmeal was not in any case adulterated. The specimen sent me was not well ground; the particles were unequal in size, so that there appeared to be more substances than one. There was also a large number of brown particles, arising either from some of the external husk, or, as is much more probable, from some admixture of foreign plants too often found in the oat-fields. Generally, however, the specimen was not clean; and, as a Scotchman, I may say, that it was hardly suited for porridge. I believe there are some nutritionary advantages connected with the use of this article of food, but it is not extremely attractive, and, when badly manufactured, it becomes repulsive, a condition more frequent than the contrary in England.

Sugar.—This article was found by Mr. O'Neill to be adulterated with starch sugar; the specimens sent to the other analysts were pure. Starch sugar is not unwholesome, but it has less sweetness than cane sugar, so that less value is obtained for the money. It is an adulteration employed for no other purpose than to increase the profit. It is a direct fraud without an apology, such as by some people is granted to the use of alum.

Pepper.—One specimen was adulterated. This was in part of really good material, but the whole was very weak, containing an enormous amount of starch and a material which seemed to be artificially compounded by mixing up a starchy material with water, then drying and breaking up into small pieces; one piece was as large as a pea. Another ingredient seemed to have been baked nearly black, and strongly resembled the husk of pepper; it contained little inorganic matter, 1·39 per cent. Here was a great and systematic adulteration, but it may not be injurious to health.

Mustard.—Two specimens were adulterated, one with wheaten flour and one with starch. Mr. O'Neill's specimen seems to have been very pure; mine was nearly all starch, and very slightly yellow. I have obtained the same for many years at one of the principal grocers.

Pickles.—These were in no case systematically adulterated, as all the analysts believe, but in three cases copper was found in traces, in one case tin was found, and in another case lead; it is probable that the traces came from the vessels which were used. Dr. Schunck observed that the copper was not found in the liquid but in the solid, the same may be said of mine. It is better to use earthen-ware for all such acid liquids, metals ought not to be used, at least the precious metals only can be considered free from danger. Silver coatings are given by Messrs. Fryer, Benson, and Forster, to vessels in which fruit is boiled. It is scarcely possible to bring vegetable juices in contact with the ordinary metals without dissolving some, and iron is the only one which is safe when dissolved. Even tin, which is one of the least soluble metals, may be detected in an innocent mixture, such as bread and water, or milk, if it is put into a tin can and allowed to stand two or three days. As to copper, the ease with which it is taken up by liquids, which are as nearly neutral as liquids in nature generally are, is remarkable. As an instance of importance and of a kind not generally known I may mention that even a ball of copper, such as is used in cisterns for opening or shutting by its rise or fall the water tap, may give off as much copper to the water as will make itself perceptible. A curious case of this kind came under my notice; the water had been used for seventeen years and no one complained, but some one from a distance discovered metal by his taste alone and refused to drink the water. This danger arising from the common apparatus of the cistern is, I think, a new one; but people are so differently affected that probably the small amount alluded to would not affect unpleasantly more than one occasionally. It may be supposed that I am a little wandering from the subject, but it is a useful thing to observe here and to prove by examples that it is not an unnecessary labour to seek out even minute adulterations in food. If the senses can detect quantities so small as those to which I allude, we may be certain that the chemical agents within us will not be behind.

Vinegar.—This substance seems to have been the purest and best of the specimens, as it was in two instances at least, as mentioned by Drs. Schunck and Roscoe, above the average in strength as well as free from impurity. That sent to me was suspicious, it was weak, having only 1 55 per cent. of dry acid, and 0·16 in about 10 per cent. was sulphuric. Again, however, we must remark no poisonous adulteration; we can scarcely attribute any blame to this small amount of sulphuric acid even if it were free, which it is difficult to prove.

Tea.—Dr. Calvert's specimen was artificially coloured; no other adulteration is reported, nor is the nature of the colouring matter said to be poisonous.

The specimen sent to me as mixed tea contained ten to fifteen grains of green, the whole of the remaining portion of the two ounces being black. The name "mixed tea" is therefore correct abstractly considered; but, taking it as persons in general would understand it, it is a fiction. This is a subtle method of deceiving, and one that is extremely effective; an additional price is asked for the tea, and is obtained at little trouble or expense. There was a little "facing" as it is called on the green tea, but only to make it more beautiful; the tea was in reality green. Many persons are inclined to think that there is no such thing as green tea, the accounts concerning it have been so contradictory; but the action of the two on the brain or the nerves is so different that he must be extremely fortunate who is not sufficiently sensitive to perceive that there are two entirely different qualities in the green and black. This so-called mixed tea was not an adulteration but a deception certainly.

Coffee.—Three specimens contained chicory, two were free. Dr. Schunck found equal quantities, Dr. Calvert found beans, and Mr. O'Neill a fatty substance, in addition to the chicory. That sent to me was pure and good.

Cocoa.—Was in four cases out of the five adulterated with starch; Mr. O'Neill finds sugar also, and my specimen contained a mineral substance, consisting in a great measure of oxide of iron, still the amount was not great. It was added to give the reddish colour of which the starch had probably deprived the cocoa mixture. The total amount of mineral matter was 2·54 per cent.

Butter.—Of this substance there are only three reports. No adulteration is mentioned, except water, which exists in Dr. Roscoe's specimen to the extent of twenty per cent. It is very difficult to obtain good butter about this district,—salt butter is washed fresh and is mixed with really fresh new butter. The possibility of detection is avoided, no chemical experiment can discern such frauds; a delicate taste and smell form the best reagents. A qualified analyst or inspector of food ought to possess senses of great refinement. If the evidence of his senses, unaided by experiment, be not considered enough before a court for the conviction of any man, it is at least valuable as a guide in his own enquiries; sometimes it is the only evidence and must be taken.

Beer.—Was not adulterated. Mr. O'Neill found five per cent. of alcohol in his specimen, Dr. Roscoe six per cent.

Whiskey.—Mr. O'Neill finds to be made from an inferior grain, and Dr. Roscoe finds dissolved malt.

Gin.—Seems only to have been adulterated with water. It might here be remarked that an adulteration of this kind is very much to be admired, but it is not so; some little evil is done by the variation in strength, as those who are accustomed to the weak may greatly damage themselves when coming to the strong, and it is a fraud unquestionably.

Brandy.—Dr. Calvert finds this spirit adulterated with methylated spirit; Dr. Roscoe finds a common spirit coloured with burnt sugar and flavoured with dried plums; and Mr. O'Neill a concocted British brandy.

No specimen of Milk was sent, and yet I have had specimens adulterated with four to six times their volume of water, and sold in the open market. Here water is a positively deleterious, I may say deadly, substance; children are supposed to be obtaining nourishment when they are merely starved on water.

Mr. O'Neill in summing up says,—"The result of my examination of the articles on behalf of the Manchester and Salford Sanitary Association, and of my private practice as well, tends to show that the adulteration of food with pernicious substances is very rare indeed; the adulterations or mixtures practised in coffee, cocoa, bread, and some other articles, are generally known to the public, or in fact called for by them. Although I think it very desirable that there should be an analytical officer appointed in large towns for facility of reference, I cannot give the opinion without at the same time remarking that as far as my practice enables me to speak there has been an unnecessary amount of alarm created in the public mind by the exaggerated statements of the extent of adulteration."

To this I may add that, although the dangerous adulteration is small, the amount of actual adulteration is great: amongst seventy-five articles examined seventeen are adulterated; five, the pickles, have impurities of a very poisonous character, although in small quantities; four, the breads, have impurities in greater quantity, although of a less poisonous quality, and three breads out of five contained alum.

We may say then that the conclusion to be drawn from the results sent by the chemists, and acquiesced in by these gentlemen, is that dangerous adulteration of food is not extensively practised in Manchester; but to this must be added that fraudulent practices connected with food are frequent. Are we to conclude then that the agitation on this subject has been entirely unnecessary as regards this city? and that the care which the legislature has shown by its enactments for the well-being of the population in the matter of pure food has been caused simply by needless alarm? To both these questions I would answer; no. My belief is that the agitation has been of incalculable value; the whole nation has been taught by one great enduring and well impressed lesson the value of purity in its diet, as it had previously, by the investigation into the health of towns, been taught the value of general cleanliness, and of purity of air. This result is enough of itself to justify the agitation, even if purer food be not yet obtained; but I believe firmly that it has been obtained. Unluckily we have no series of investigations of an earlier date relating to Manchester specially; but, as far as my own experience is concerned, I may say that when I came to Manchester I found flour containing several per cent of sulphate of lime in a considerable number of cases, lately I have found none. I found sweetmeats glaringly adulterated with as much as 40 per cent. of sulphate of lime, lately not so. I did not make an extensive investigation and cannot speak with that great knowledge which renders Dr. Hassall's and Dr. Letheby's opinions so valuable, but such as my experience has been it is right to give, since no one comes forward as commissioner for this district. We cannot refuse to attribute much of this result to the labours of Dr. Hassall and the Lancet, added to the increased knowledge of vegetable and animal chemistry which has grown as a magnificent harvest from seed sown by Liebig in this country, which he chose as the most fertile soil for his ideas. We must not however forget that the flour and corn merchants claim a right to some of the credit for organising a committee for pursuing defaulters with vigilance; this is a meritorious act of which the public does not seem aware.

Regarding the Act of the Legislature it may be said that it was, to a great extent, an embodiment of the feeling of the country on the subject, and is of great value, were it only from the fact that it recognises official supervision. I shall not attempt to criticise the general working of the Act, but something must be said concerning the propriety of taking advantage of its permission to appoint an analyst here. It would appear that little advantage will be derived from an analyst who is not also an inspector. It does not seem sufficient that an analyst should be appointed who shall perform whatever work is sent to him by individuals, even at a low price. This throws the care of its food on the public itself, but the use of an Act is greater when it throws the care on some specially appointed person who shall both be the eye and the hand. It seems as if an individual might accomplish all that is required for the whole of South Lancashire, or some such district. It is scarcely fair to appoint one merely for towns whon the villages are most in danger; and it is useless to the poor to appoint one for them if they are expected to call him in and pay his fee, no matter if that fee be only a penny. They have not the time to attend courts, and they don't understand the mode of conducting an enquiry. The objection to such an officer has been that he would be unwilling to go round acting as an informer, and that no scientific man could endure such a post. My belief is that to inform would be one of his rarest duties; that is, to inform a magistrate. He would only inform the dealers, the retail chiefly, and they would be glad of his advice; they would not dare to oppose his opinion, and they would gladly seek markets which would not bring them into disgrace. His information would be private, unless it were neglected, and these cases would I think be rare. The reports would be made to the authorities who appointed the analyst, and discretion used in the use of names. In most cases suppression of names would be unnecessary, because no man need be ashamed of selling that which he believed to be pure. The wholesale dealers are not very numerous, and would soon learn the value of precautions; if not, it would be those chiefly who would be informed against, and that not until properly and privately warned. A judicious man might in this way purify the food of a whole county.

By the *act* the county has a right to appoint an analyst, and the villages and hamlets might receive the benefit as well as the large cities. This would be an inexpensive establishment for each town and would be an actual protection, instead of a mere permission such as we now have. At present the act says: guard yourselves, there is a policeman who will help you if you pay him.

I am more inclined to take this view from observing the mode in which public information takes hold of individuals in every corner of this country. The whole nation frequently thinks on one subject in a similar manner, and at one time, and becomes thoroughly acquainted with it, a little care is wanted merely to keep alive the thought. Purity of food will be obtained by calling the attention of the public to it by occasional acts here and there, better than by the daily prying inspection into every individual shop. One man with a large district and a wide field of observation will be more valuable than very many who shall irritate by frequent interference, and rather provoke to opposition instead of assisting. The inspector would, in fact, gradually lift up the trader, by keeping alive both his sense of honour and his desire for security. At present the milk of which I spoke may be sold with impunity; who is to inform, even if an analyst were appointed? I see no value in an analyst without active inspection. We look on the adulterations here proved to be smaller than expected; and, considering the dangerous materials which the chemists were prepared to find, the result is most pleasing; but we must not forget that, after all, the report shows a very large amount of fraud. The deep vice which would allow a man to mix poison with the food of his neighbours is not to be found here. A higher civilization has produced a greater watchfulness in the public, and a milder form of crime in the trade. It is this watchfulness that ought to be cultivated, and its public embodiment in an officer would tend to its perpetuation.

R. ANGUS SMITH.

POWLSON AND SONS, PRINTERS, BOW STREET.

Results of Microscopical and Analytical Examination of Articles of Food purchased in Manchester.

Note.—The various articles were purchased by an officer of the Manchester and Salford Sanitary Association, from shops supplying the working classes in different parts of the town. The analysts then examined the articles and made independent reports of them, which are here tabulated.

Of each article reported on there were five distinct samples, obtained at as many different shops, thus making eighty samples which have been examined.

ANALYST.	PEPPER.	MUSTARD.	VINEGAR.	PICKLES.
Dr. Calvert	No report	Not adulterated	Not adulterated	Contains traces of lead.
Mr. O'Neill	Not adulterated	Not adulterated	Not adulterated	Contains copper and zinc.
Prof. Roscoe	Not adulterated	1. Not adulterated.*—2. Adulterated with wheaten flour.	4·7 per cent. of acid and free from sulphuric—not adulterated.	Not adulterated.
Dr. Schunck	Not adulterated	Not adulterated	4½ per cent. of acid above average—not adulterated—quite free from sulphuric acid.	Trace of copper in the solid, not in the liquid.
Dr. Smith	Adulterated	Starch chiefly	Not adulterated, but below average strength 1·55 dry acid.	Minute traces of copper, not in the liquid.

* Another sample was found largely adulterated with wheaten flour.

Remarks.—The small traces of metals discerned in the pickles are attributed by the analysts to the metallic vessels in which they were prepared, and is an evidence of carelessness rather than fraud.

ANALYST.	FLOUR.	OATMEAL.	BREAD.	SUGAR.
Dr. Calvert	Not adulterated	Not adulterated	Considerable quantity of alum	Not adulterated.
Mr. O'Neill	Not adulterated	Not adulterated	36 per cent. water—potatoes—no alum.	Adulterated with starch sugar.
Prof. Roscoe	Not adulterated	Not adulterated	48 per cent water—contains tolerably large amount of alum,	Not adulterated—quality fine.
Dr. Schunck	Not adulterated	No report	Not adulterated—no alum	Not adulterated.
Dr. Smith	Not adulterated	Not adulterated, but not prepared well or cleanly.	Alum 9·59 grains per lb.	Perfectly pure.

ANALYST.	BEER.	WHISKY.	GIN.	BRANDY.
Dr. Calvert	Not adulterated	Not adulterated	Not adulterated	Adulterated with methylated spirit.
Mr. O'Neill	$5\frac{1}{2}$ per cent. alcohol—not adulterated	43 per cent. alcohol — an inferior grain spirit.	$32\frac{1}{2}$ per cent. alcohol—not adulterated.	43 per cent. alcohol—a concocted British brandy.
Prof. Roscoe	6 per cent. alcohol.—not adulterated	38 per cent. alcohol—not adulterated, but has some malt in it.	30 per cent. alcohol—not adulterated, except with water	48 per cent, alcohol—a common spirit, coloured by burnt sugar and flavoured with dried plums.
Dr. Schunck	No report	No report	No report	No report.
Dr. Smith	No report	No report	No report	No report.

ANALYST.	MIXED TEA.	COFFEE.	COCOA.	BUTTER.
Dr. Calvert	A mixture with artificially colored leaves.	Mixed with chicory and perhaps beans.	Not adulterated	Fair quality.
Mr. O'Neill	Not adulterated	Great deal of chicory and fatty substance.	Chiefly potato starch and sugar	Not adulterated.
Prof. Roscoe	No report	Free from chicory	About 50 per cent. potato starch	More than 20 per cent. water.
Dr. Schunck	Not adulterated	Mixed coffee and chicory, equal quantities.	Adulterated with starch	No report.
Dr. Smith	So little green that it is unfairly called mixed.	No chicory—not adulterated	Adulterated with starch and a mineral colouring matter.	

MANCHESTER & SALFORD

SANITARY ASSOCIATION.

REPORT

OF THE

HEALTH

OF

MANCHESTER & SALFORD

FOR THE THIRD QUARTER OF THE YEAR 1863;

Compiled from the Weekly Returns of the Sanitary Association, and presented to the Committee.

MANCHESTER:
POWLSON & SONS, PRINTERS, BOW STREET.
1863.

QUARTERLY REPORT.

SUMMARY.

THE WEEKLY RETURNS of the Manchester and Salford Sanitary Association have now regularly appeared for upwards of three years. During all this time the numerous contributors, on whose voluntary and altogether unpaid assistance the Association is dependant for its reports, have in no single instance failed to supply the required information. To these gentlemen, no less than twenty-seven in number, all members of the medical profession, and all connected either with Public Hospitals or Poor Law Districts, the grateful acknowledgments of the Association are justly due for the time and labour they have bestowed in furnishing, week after week, full and carefully compiled returns respecting the number and nature of the new cases of disease that may have fallen under their notice in their respective districts.

The whole series of weekly tables, originally started on the 4th of August, 1860, at the suggestion and through the exertions of Mr. Arthur Ransome, the late Honorary Secretary, is thus in every respect full and complete.

Moreover, in addition to the medical contributions, several other gentlemen carefully record and kindly supply to the Association a series of weekly meteorological observations, and so the extent to which the ebb and flow of epidemic diseases appears dependant upon varied atmospheric influences may be readily seen and determined.

The Registrars, likewise, of eleven districts of Manchester and Salford, districts containing in the aggregate a population of upwards of 420,000, obligingly furnish the number of births and deaths they may be called upon to record, and from these latter returns a series of quarterly mortality tables has been carefully drawn up and tabulated by Mr William Royston.

It will thus be seen that, during the last three years, a vast amount of valuable statistics has been accumulating,—statistics from which the rise and fall of epidemic diseases may be traced—their intensity measured—and the particular districts in which they may have occurred may be pointed out, and attention directed to the conditions under which they appeared to have originated. With a view of turning this information to greater account, it is at present proposed to analize and briefly comment upon these weekly tables at the end of every three months, and to bring out the results in the form of a short Quarterly Report. As the materials for these reports will be deduced from the thirteen preceding returns, they will terminate with the last Saturday in the months of December, March, June, and September; and, consequently, will not exactly correspond with the quarters of the Registrar General. The extent and intensity of the more ordinary epidemics will be first considered in the same manner as in the "Summary" recently appended to the Weekly Returns; and, secondly, a few remarks will be offered on the Quarterly Mortality Tables of Mr. Royston.

DISEASES.

As regards diseases, then, we are fully justified in asserting that the quarter just ended exhibits a highly unsatisfactory state of the public health. Both the total number of new cases of disease, and especially those of the zymotic order,—Scarlet Fever, Small-pox, Measles, Whooping Cough, and Continued Fever, alike appear very much in excess of the extent to which they prevailed in the year 1862. Thus, while the total number of cases amounted in the quarter ending September, 1862, to 16,334, during the late quarter it reached the more formidable total of 20,650, exhibiting an excess in the aggregate of about one fifth. In the same manner, as respects particular diseases, we may remark that in the September quarter of 1862 only fifty-eight cases of Scarlet Fever occurred, while in that just ended the number rose to six hundred and two. So, in the case of Small-pox, in 1862 we find thirty-eight cases,—in 1863 two hundred and sixty. Under Continued Fever, Measles, and Whooping Cough, we notice an increase amounting respectively to sixty-four, twenty-five, and sixty-seven. Diarrhœa, likewise, during the last three months, proved much more prevalent, the number of seizures in 1862 being 1,395, and in 1863 2,075.

Among the diseases of the late quarter two, especially, of the zymotic order, both from their general importance and from the extent to which they prevailed, demand consideration at our hands. And, first, as respects Small-pox: In the September quarter of 1861 only fourteen new cases occurred in connection with the Public Institutions of Manchester and Salford. During the corresponding quarter of 1862 the number rose to thirty-eight. From that time to the 6th of June of the present year the disease appears to have steadily gained ground. Thus, in the last quarter of 1862, no less than ninety-two cases were stated to have occurred; by the end of March the number amounted to three hundred and ten; and, by the end of June, in the second quarter of the present year, to five hundred and fifty-two. From this time, doubtless owing in no small degree to the attention directed to vaccination, and the removal of the sick from the abodes of the healthy to such Public Institutions as the Infirmary and Workhouse, the disease seems gradually to have abated. Thus, it is gratifying to be able to record in the last quarter a fall from five hundred and fifty-two cases to two hundred and sixty-three. If we now turn to consider the districts in which, during the last twelve months, the disease proved most prevalent, we obtain the following results: In the St. George's Poor Law District the number of cases was ninety-one; in the St. Peter's, seventy; in the St. Michael's, sixty-eight; and, in the St. Andrew's, sixty-three. One hundred and forty-two patients were admitted into the Workhouse and eighty more into the Infirmary. In the Salford Workhouse thirty-one cases were treated. As regards Salford we may observe that the disease proved later here in making its appearance than in Manchester. Thus, in the first quarter of the present year, one hundred and forty-nine cases occurred in the former and only twenty-one in the latter. In the following quarter, however, that terminating in June, we find the proportion relatively to population more nearly maintained, two hundred and seventy-four occurring in Manchester and one hundred and twenty-three in Salford.

Another point of much interest as respects the late epidemic of Small-pox concerns its *intensity*. Here, too, the Weekly Returns permit us to arrive at a tolerably correct approximation to the truth. During the last twelve months, out of 1,126 persons attacked by the disease, forty-two are stated to have died. It is thus satisfactory to observe that though the late epidemic proved general it was by no means equally fatal, the death rate not exceeding one in 26·3. In fact it nearly exactly corresponded with that of Measles, which for the last year was one in 26.

SCARLET FEVER. — Of the zymotic diseases prevailing during the late quarter by far the most general and fatal was Scarlet Fever. For a long time it has stealthily but progressively gained ground. Thus, in the September quarter of 1861, we find a record of only seventeen cases. In the corresponding quarter of the following year the number rose to fifty-eight. During the present year it has still more rapidly continued to increase. Thus, in the March quarter, one hundred and fifty-seven occurred; in that of June, two hundred and eighty-one; and in that just ended no less than six hundred and two. It is instructive to mark, both in the case of Small-pox and Scarlet Fever, a like tendency to spread gradually. The word "*outbreak*" then, as applied to these epidemics conveys an idea opposed to the truth. They do not fall *suddenly* on the population, like some destroying blight, but by little and little well nigh feel their way, as though courting the adoption of measures opposed to their spread. And if some such law of gradual diffusion is generally found to hold true in the case of epidemics, it would appear that, though certain states of the atmosphere doubtless prove peculiarly favourable to their spread, nevertheless in the great majority of seizures, at any rate, each particular case is literally passed on from man to man. This sort of gradual diffusion, as opposed to any sudden outbreak of the disease, is well seen by a reference to the numbers that occurred during each successive quarter in several of the Institutions and Districts. Thus, in the Poor Law Districts, the numbers for the last three quarters were sixty, ninety-six, and one hundred and fifty-nine. In the Manchester Public Institutions fifty-one, eighty-six, and one hundred and fifty-nine. In Salford fourteen, twenty-two, and thirty-nine. In Hulme six, twenty, and eighty-nine. In Chorlton fifteen, thirty-three, and one hundred and twenty-five; and, of course, similarly in respect to the general total of three quarters, one hundred and fifty-seven, two hundred and eighty-one, and six hundred and two.

Let us here turn to enquire what has been the *intensity* of the disease, in other words in what proportion relatively to the number attacked it proved fatal; and this enquiry is the more important from the meagre body of statistics bearing on this subject. We have already stated that, during the last three months, six hundred and two seizures are shown to have occurred; of this number seventy-three terminated fatally, exhibiting a death-rate of one in 8·3; and this proportion of deaths to cases appears in respect to Scarlet Fever to have been tolerably evenly maintained in each quarter in the course of the present epidemic, at least as concerns the general total of all the Institutions and Districts; though, on descending to particular localities, the range between the extremes proves very much wider. Thus, turning to the general Scarlet Fever death-rate, in each of the last four quarters, we find it in December 1 in 7·5, in March 1 in 7·9, in June 1 in 9·3, and last quarter, as already stated, 1 in 8·3. On looking to Districts, however, we find the highest death-rate in Ardwick (1 in 4·5), next among the patients of the Salford Dispensary (1 in 5·3), then follow Chorlton (1 in 5·5), Hulme (1 in 9·9), the Public Institutions of Manchester (1 in 10·6), and, lastly, the Manchester Poor Law Districts (1 in 13·9).

The disease which exhibited the highest death-rate during the quarter was Diphtheria. But the number of cases was remarkably small, only nine; of these five ended in death, or 1 in 1·8. On taking a greater number of cases we still find the mortality very high. Thus, out of forty-five that occurred during the last twelve months, no fewer than fourteen died, or 1 in 3·2. We may observe that a strong proof of an essential distinction existing between Scarlet Fever and Diphtheria—a distinction by no means universally admitted—is the fact that, during the late extreme prevalence of the former, so few instances of the latter should have been found to occur.

Next to Diphtheria the most fatal disease of the year was Croup, the death-rate amounting to 1 in 2·5, then Scarlet Fever (1 in 8·3), Consumption (1 in 10·2), Inflammation of the Lungs and Pleurisy (1 in 10·6), Small-pox, Measles, and Continued Fever (1 in 26), Diarrhœa (1 in 30), Whooping Cough (1 in 32), and Bronchitis (1 in 40).

From the low death-rate under Continued Fever it is evident that the proportion of cases that belonged to the Typhus and Typhoid varieties of the disease was very small, probably not more than 1 in 5 or 6, the remainder being merely examples of Febricula, rarely observed to terminate in death.

DEATHS.

The conclusions respecting the highly unsatisfactory state of the public health, at which we have arrived from an examination of the Weekly Returns, is fully borne out by the statistics contained in the last Quarterly Mortality Tables, drawn up for the Association by Mr. William Royston and appended to our Report. We would direct especial attention to the valuable information it contains. He there shows that in the course of the last three months the gain to every 10,000 of the population amounted from births to ninety-three; and the loss by deaths to eighty-one. Were such a birth and death rate maintained for twelve months the former would be represented by 39·5 in the thousand, and the latter by 32·4; the births only exceeding the deaths by about one-ninth. This low rate of increase has of late been frequently pointed out in the weekly "Summary." It contrasts unfavourably with the years 1861 and 1862, inasmuch as in each of those two years the death-rate amounted to 28, and the birth-rate to 39·5 and 39 respectively. It is right however to state that, during the first two quarters of the present year, the death-rate was lower than during the last three months; although, even then, it was at the rate of 30 to the thousand, or two more than in the years 1861 and 1862. On turning to particular districts we find that, in the quarter just terminated, the rate of mortality proved highest in Salford, where, out of every ten thousand persons living, 87 died; thus giving an annual death-rate of 34 in the thousand; but the births (103) were also unusually numerous. Thus the loss to the community was less marked here than in some other districts; in the Ancoats, London Road, and Deansgate, for example, 82 died in every 10,000, while the births to the same number of persons amounted to 87 and 88 respectively. In other words, in these Registration Districts, containing an aggregate population of upwards of 113,000, the number of deaths amounted to 938 and the births to 998, or an annual death-rate of 32·8 in the thousand, and a birth-rate of about 35. From none of the other districts are the returns so unsatisfactory. In Hulme a mortality of 81 occurred in the same number of persons, in St. George's 78, in Ardwick, 75, in Chorlton 60, and, lastly, in Pendleton and Pendlebury 59.

Now, it may be asked, what are the causes to which this unsatisfactory state of the public health, as indicated both by the weekly disease tables and the mortality returns, is to be attributed? Is it simply due to that oft accused but somewhat vague expression—an unhealthy season? in other words to some obscure atmospheric influences opposed to health and longevity. To some extent, no doubt, such a season prevailed during the last quarter; week after week the Registrar General showed that the deaths in London exceeded the average. The excess, however, relatively to population in the case of the metropolis, proved considerably less than that exhibited in our returns. It seems difficult, then, to resist the conclusion that the hard times through which the people have passed and are still passing are beginning to tell; that a population long accustomed to live well on high but hard earned wages will not flourish beyond a certain time, at any rate in full physical vigour, under the various depressing influences which have combined to assail them. And what are these influences?—poor fare, mental depression, crowded dwellings, and a sickly season. That the food upon which the poorer portion of the factory operatives have been forced to subsist was not such as they were brought up on and accustomed to none will deny. It seems reasonable, likewise, to suppose that inability to obtain full employment among a population little disposed to shirk the calls of labour, by depressing the spirits, has a tendency also to lower the health. As a natural consequence of low wages houses and lodgings have been more densely occupied, and the never excessive supply of fresh air in the dwellings of the poor has been still more vitiated. In the first half of the present quarter the sun shone bright, penetrating even the smoky atmosphere of crowded cities. Decomposition proceeded more rapidly, the air heated even amid courts and alleys drew forth from the drains, no longer purified by copious showers, their noxious exhalations. In such warm weather as prevailed in July surprize must often have been felt, on observing that the mean temperature of the week was below the average for the season. We must bear in mind, however, that the mean reading of the thermometer is taken in the shade, while men in fulfilling their various avocations are often forced to endure the full rays of the sun. Thus their sensations and the reading of instruments, inasmuch as arrived at under different conditions, were not likely to tally. It is also on the brightest days that the range of temperature between night and day is often most marked; clear, cloudless nights permit the radiation of heat from the earth. At such times, then, it often happens that as the days are hotter so are the nights colder. That a chill often strikes in upon the system from such sudden transitions, especially trying during the period of infancy, may readily be believed.

Such, probably, were some of the causes which combined to render the third quarter of the year 1863, in these districts, so prolific in death and disease.

JOHN ED. MORGAN, M.B., M.A. (Oxon.),
HON. SECRETARY MANCHESTER AND SALFORD
SANITARY ASSOCIATION.

Committee Rooms,
33, *Pall Mall.*

Powlson & Sons, Printers, Bow Street, John Dalton Street.

MANCHESTER AND SALFORD

MORTALITY RETURN FOR QUARTER

DISTRICT.		POPULATION, 1863.	SMALL-POX.		MEASLES.		WHOOPING-COUGH.	
			No.	Rate.	No.	Rate.	No.	Rate.
MANCHESTER.	Ancoats	56,191	5	·9	6	1·	12	2·1
	St. George's	48,294	6	1·25	15	3 12	20	4·17
	Market Street (1861)	23,523	5	—	2	—	12	—
	London Road and Deansgate	57,633	7	1 2	20	3·45	8	1·38
Salford		71,258	13	1·83	21	3·	26	3·66
Pendleton, &c.		25,160	1	·4	14	5·6	—	—
Chorlton		45,140	5	1·11	5	1·11	6	1·33
Hulme, &c.		71,461	10	1·4	7	1·	9	1·25
Ardwick		22,124	6	2·7	3	1·4	6	2·7
TOTAL		420,784	58	1·37	93	2·2	99	2·35

This Quarter is compiled from the Weekly Returns, and consequently will not cor

SANITARY ASSOCIATION.

ENDING SEPTEMBER 26th, 1863.

Scarlatina.		Diarrhœa.		Fever.		Disease of Lungs.		All Causes.		Births.	
No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
48	8·6	95	17	11	2·	95	17	459	82	487	87
30	6·25	76	16	6	1·25	61	13	375	78	455	95
5	—	30	—	7	—	8	—	332	—	192	—
91	15·7	122	21	4	·7	34	6	479	82	511	88
30	4·22	127	18	15	211	110	15	615	87	732	103
17	6 8	22	8	2	·8	—	—	147	59	229	91
42	9·3	37	8	6	1·3	54	12	269	60	365	81
100	14·	72	10	15	2·	101	14	578	81	702	98
22	10	22	22	4	1·8	30	14	165	75	244	110
385	9·14	603	14	70	1·66	493	11	3,419	81	3,917	93

with the Registrar's Quarter. The Rate is for every 10,000 of the population.

MANCHESTER AND SALFORD

SANITARY ASSOCIATION.

REPORT

OF THE

HEALTH

OF

MANCHESTER AND SALFORD

FOR THE FOURTH QUARTER OF THE YEAR 1863.

Compiled from the Weekly Returns of the Sanitary Association,
and presented to the Committee.

MANCHESTER:
POWLSON & SONS, PRINTERS, BOW STREET, JOHN DALTON STREET.
1864.

MANCHESTER AND SALFORD SANITARY ASSOCIATION.

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QUARTERLY REPORT.

In the fourth quarter of the year 1863 the state of the public health in Manchester and Salford, though more favorable than in the corresponding quarter of 1862, still proved less satisfactory than might have been desired. We learn from an examination of the weekly returns of the Sanitary Association that, in the last thirteen weeks of the year 1863, the total number of new cases of disease that came under the observation of the medical officers connected with our various Charitable Institutions and Poor Law Unions amounted to 21,131. In the corresponding quarter of the year 1862 it was 21,545; and, in the preceding September quarter, 20,650. On comparing the December quarters in the two years we obtain the following results:—The zymotic diseases, with the single exception of Measles, all proved more general in 1863 than in 1862, the Scarlet Fever cases amounting respectively in the two quarters to 867 and 172, those of Small-pox to 144 and 94, Fever to 734 and 703, Whooping Cough to 215 and 183, and, lastly, Measles to 121 and 236. On the other hand, Bronchitis and kindred affections of the chest, doubtless as a consequence of the intense cold which prevailed in the latter part of November, 1862, were far more general in that quarter than in the last thirteen weeks of the year 1863, the seizures amounting in the former to 4,797, in the latter to 3,533. It is worthy of remark that, though in the year 1862 so many persons experienced attacks of Bronchitis, Influenza, and Catarrh, still no corresponding increase was observed in respect to Consumption, which proved, if anything, somewhat more general in 1863.

Let us next turn to enquire what was the *intensity* of some of the more severe maladies, in other words what was the proportion of deaths to seizures. The disease which in the late quarter proved most fatal was Croup, one death occurring in every 2·6 cases; next follows Diphtheria, one in 3·6; Scarlet Fever, one in 6·3; Consumption, one in 9·6; Small-pox, one in 14·5; Measles, one in 15·1; Continued Fever, one in 26·2; and Bronchitis, one in 38. Of the 21,131 cases treated at the various Institutions and Poor Law Districts 639, or one in every 33, terminated in death. Of these deaths 123 arose from Scarlet Fever, 91 from Bronchitis, 80 from Consumption, 28 from Continued Fever, 13 from Small-pox, 10 from Diarrhœa, and 8 from Measles.

At the end of this Report will be found two most valuable Mortality Tables, drawn up for the Association by Mr. William Royston, the one representing the deaths in the course of the late quarter, the other during the whole of the year. In these tables Mr. Royston has calculated not only the total number of deaths and births in the several districts, but has likewise shown the rate to every 10,000 in which the more important diseases proved fatal. We learn in the former that, during the last thirteen weeks of 1863, out of every 10,000 of the population 78 died, thus giving an annual death-rate of 31·2 to the 1,000. An examination of these tables clearly shows that the high quarterly mortality arose solely and exclusively from Scarlet Fever, for, on subtracting the deaths from this disorder from the general total, we find the death-toll reduced from 31 to 27 in the 1,000. In Mr. Royston's yearly table we learn that the deaths for the four quarters of the year 1863 amounted to 13,058, or about 31 per 1,000. That such a death-rate is high we are doubtless bound to admit, it is nevertheless important to bear in mind that the past year, generally, throughout the country, was an unhealthy one; and, if we compare the mortality of Manchester with that of Liverpool, we shall see grounds for feeling thankful that it did not prove still heavier. Thus, for the whole borough of Liverpool with its population of 443,930, the death-rate amounted to 33 per 1,000; in Manchester and Salford it was as we have observed 31. Again, in the parish of Liverpool, the most unhealthy quarter of the borough, it was 36·3; in Ancoats, a district occupying last year the same unenviable position in the mortality returns of Manchester, it was 34, or nearly 3 less. There is one circumstance, however, which renders the comparison between the two towns even more favorable to Manchester than the foregoing figures, standing alone, would lead us to infer — the wide-spread diffusion and fatality of Scarlet Fever. Such was not the case, at least to any corresponding degree, in Liverpool, for the report declares that "the stream of deaths was fed by every class of disease, and owed its dimensions to no single supply." This comparison between the mortality of the two chief towns of Lancashire, similarly situated in many important particulars, yet differing widely in the nature of the employment of a large portion of their population, goes to prove that, though among ourselves many of the operatives were by no means fully employed, nevertheless the public health has not in consequence suffered any material deterioration.

There is one question connected with the Manchester death-rate deserving the most serious consideration of the Sanitary Association,—that question concerns the excessive infantile mortality. With that courtesy and readiness to lend a helping hand which has ever characterized the various contributors to our Returns, the Registrars have this year favoured us with a statement of the number of deaths of children, under five years of age, which occurred last quarter in their respective districts. The results thus brought to light are certainly startling, for of the 3,286 deaths in the December quarter 1,622, or nearly one half, were those of children who had not yet completed their fifth year. In some of the districts even this heavy mortality was considerably exceeded: thus, in the Greengate district, it was at the rate of 58 per cent. of the total number of deaths; in the Ardwick of 56; in the Hulme of 54: in the Pendleton of 53; and in the Ancoats and Deansgate of 52. In the early deaths of these 1,622 children we read the grand explanation of that excessive mortality which has so often been brought forward against the inhabitants of the North-western division of England, as though the nature of the employment carried on in the cotton mills were necessarily inimical to health and longevity. That such is not the fact is rendered apparent by the following considerations: We have already stated that, during the last quarter, the deaths were at the rate of 31 in the 1,000, but of these 31 no fewer than 15 were in children under five years of age. Now it was shown by Mr. Royston nearly four years ago, that in some healthy country district as, for example, in Glendale in Cumberland, the death-rate at this early age does not exceed four in the 1,000; could then the mortality in Manchester be reduced within equally narrow limits the annual death-toll would be represented by 20, instead of 31. The average for the whole county is 22.

Having thus touched, generally, on some of the more important diseases which prevailed during the last quarter, having pointed out both the number of deaths and the early age at which many of those deaths occurred, we propose, briefly to consider some points of interest as regards the mode of diffusion and history of that disorder which contributed in so marked a degree to swell the tide both of death and disease. First, then, the statistics of the last quarter tend still further to confirm a remark made in our last Report, that the advance of Scarlet Fever is in all cases steady and progressive, not sudden or rapid. It does not burst out in different quarters of the town at one and the same time, as though propagated by some obscure but widely diffused epidemic influence, on the contrary it appears to travel from district to district, and during each successive quarter, and well-nigh during every passing week, steadily gathers strength. Thus, the first week in which in the course of the present epidemic it appeared to any unusual extent, was that terminating September 13th, 1862; in that return were recorded 11 new cases, 6 of them in a single district: in the first quarter of the following year the number amounted to 157. The disease at that time was principally confined to the township of Manchester; in Salford and Hulme the seizures were only 14 and 6. In the next quarter 281 patients applied for relief; in the third 602; and, in the fourth and last, 867. It is important, moreover, to bear in mind that these figures refer only to those persons who presented themselves at our Public Charitable Institutions, and probably did not constitute more than about one seventh of the cases which actually occurred. On turning to particular districts the same law of gradual diffusion becomes still more strikingly apparent. Thus, in St. Peter's District, the respective number of Scarlet Fever seizures in each of the four last quarters were 5, 14, 18, and 36; in St. Andrew's, 10, 12, 26, and 46; in St. Jude's, 7, 24, 28, and 38; in District I. of the Royal Infirmary, 9, 9, 16, and 18; in District II., 10, 17, 21, and 31; in District III., 13, 19, 40, and 66; at the Salford Dispensary, 11, 17, 32, and 88; and so on in almost all the remaining quarters of the town. We observe, in fact, at first but a few scattered cases which, as months and quarters roll on, become more and more widely disseminated.

There is another question connected with Scarlet Fever on which the statistics of the Sanitary Association help to throw some light, — it bears on the opinion held by many zealous though probably too enthusiastic sanitary reformers which would, if established, go to prove that both Scarlet Fever, and indeed all the other zymotic diseases, are primarily and essentially generated by the exhalations emitted from decomposing animal and vegetable matter. Now, though it may be and probably is true that defective drainage tends, in some degree, to intensify many of these disorders, we have no grounds for believing that it ever proved the sole exciting cause of any single attack, either of Scarlet Fever or Small-pox. Indeed there are many districts in Manchester second to none either as regards the attention bestowed on the drainage or the purity of the water supply, and yet, even in such apparently favoured localities, the disorder has taken on a highly malignant form, and the proportion of deaths to seizures proved unusually high. Further, that mere organic decomposition is incapable of generating either this or any of the other exanthematous fevers, we are, at least in some measure, warranted in inferring from the consideration that these disorders were altogether unknown in those ancient cities with the diseases of which, thanks to the admirable descriptions of their writers on medicine we are more intimately acquainted, and in which, owing to their notoriously defective sanitary conditions, the germs for their development, if such they really be, were most widely and lavishly disseminated.

A further interesting fact connected with Scarlet Fever is the character of greater malignancy it appears to assume in certain localities than in others, to all appearance at least, similarly situated, and it is here that we find the condition of the Manchester Poor Law Districts generally favorable. Taking them collectively we observe that in the course of the year 1863 the deaths to cases were only in the proportion of 1 to 13·5; ranging, however, from 1 in 31 in St. Michael's District, to 1 in 7 in St. Peter's; among the patients of the Royal Infirmary they were 1 in 9. In many other quarters of the town the Scarlet Fever death-rate was very much higher. Among the patients of the Salford Dispensary 1 in every 6·7 died; in St. George's, Hulme, 1 in every 5·8; in the Chorlton Poor Law District 1 in 5·7; among the patients of the Chorlton Dispensary 1 in 4·7; in the parish of St. Philip's, Hulme, 1 in 4·2; and, at the Ardwick and Ancoats Dispensary, out of 76 cases, no fewer than 24, or 1 in 3·1 terminated fatally.

Another point of interest in the present visitation of Scarlet Fever concerns the progressively increasing intensity, the proportion of deaths to seizures having steadily risen. Thus, in the second quarter of last year, only 1 case in every 9·3 proved fatal; in the third, 1 in 8·3; and, in the fourth, 1 in 6·3. This increase is very considerable, amounting in fact to nearly three deaths instead of two to every twenty seizures.

In the foregoing remarks we have endeavoured to show that, whatever were the sources from which Scarlet Fever first originated, at present at any rate actual contagion, either by intercourse with those affected, or through the medium of fornites, proves its great exciting cause. Secondly, that an examination of the statistics of the Sanitary Association lends no colour to the assertion that the disease is capable of being spontaneously generated. Thirdly, that in certain quarters of the town, for some reason not readily explained, though not necessarily less generally diffused, it nevertheless assumes a milder type. Fourthly, that its advance in the course of the present epidemic has been characterized by an increase also in its fatality.

Now, if the conclusions at which we have arrived be correct, it is proper that we should consider, inasmuch as the disorder is even now raging, what steps can be taken by the Sanitary Association with the view of setting some barrier to its onward march. And here let us recal to mind the course of action adopted some twelve months ago when a similar danger impended from Small Pox. At that time the Sanitary Association not only called upon the authorities to use their best efforts in enforcing the removal of the sick from the abodes of the healthy, but also, through the public press, made known the reality of the peril and the best method of checking its encroachments. As a consequence of the timely warning thus raised no fewer than 331 patients were removed to the Public Workhouses, Fever Wards; and, inasmuch as the total number of seizures in the course of the year did not exceed 1,269, 1 in every 3·8 cases were separated from their relatives, and thus prevented from becoming so many fresh centres of infection. When, however, we turn to enquire how far this attention to the isolation of affected persons has been observed in respect to Scarlet Fever, we find that in the course of the year only 28 out of 1,927 patients were removed to the Workhouses and Fever Hospital. To the encouraging such separation of the sick the Sanitary Association will doubtless direct its best efforts. The object may probably be promoted by addressing the Boards of Guardians on the subject; and, likewise, by pointing out to the managers of Schools and of Mills the great danger attending the admission of children from houses in which the disorder is known to prevail, and by not permitting the convalescent to return to their work for some weeks subsequently to their recovery. Such precautions, at the present day, are constantly observed in the better regulated Schools throughout the country, and, considering the heavy issue at stake, the hardship of enforcing them on the poor would not be oppressive. These remarks naturally apply solely to the poorer portion of the population, those in fact who are dependant on charity for their treatment in sickness. But the question arises as to whether, when epidemics are raging, it might not be expedient to encourage the establishment in various quarters of the town of self-supporting institutions in which, on the payment of a weekly fee, the children of artisans and of such persons among the middle classes as might desire to avail themselves of their benefits might obtain admission. Such institutions should be situated in those quarters of the town in which the disease was observed to take on a mild type. By such an arrangement those dwelling in localities less favorable to the disorder would, by the circumstance of removal alone, reap advantage. In many cases, also, in which at present every member of a family is successively attacked, the immediate removal of the first seizure might arrest the disease at its source. Such are some of the questions which a careful examination of the statistics of the Sanitary Association for the last quarter of the year 1863 have appeared to suggest,—for the investigation of others probably no less important they supply a rich store of materials; to some of them we hope in our future reports to revert, but at present the long-continued severity of a ruthless epidemic especially singled it out as one in respect to which popular fallacies however deeply rooted should be removed, the laws which govern its diffusion pointed out, and the conclusions they teach applied to check its increasing extension.

JOHN ED. MORGAN, M.B., M.A., Oxon.,

Hon. Sec. of the Sanitary Association.

MANCHESTER AND SALFORD

MORTALITY RETURN FOR QUARTER

	DISTRICTS.	POPULATION, 1863.	SMALL-POX.		MEASLES.		WHOOPING-COUGH.		SCARLATINA.	
			No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
MANCHESTER.	Ancoats	56,191	2	·35	1	·17	10	1·78	113	20·
	St. George's.........	48,294	—	—	3	·62	20	4·16	41	8·5
	Market-street, 1861	23,523	3	—	—	—	4	—	21	—
	London-road and Deansgate	57,633	2	·36	3	·52	6	1·05	91	16·
	Salford	71,258	5	·7	17	2·4	17	2·4	56	8·
	Pendleton, &c...........	25,160	1	·4	3	1·2	2	·8	20	8·
	Chorlton	45,140	2	·44	3	·67	6	1·33	70	15·
	Hulme, &c...............	71,461	8	1·12	7	·98	12	1·68	118	16·
	Ardwick	22,124	2	·91	1	·45	2	·91	31	14·
	TOTAL	420,784	25	·6	38	·9	79	1·88	561	13

This Quarter is compiled from the Weekly Returns, and consequently will not cor

SANITARY ASSOCIATION.

ENDING DECEMBER, 1863.

DIARRHŒA.		FEVER.		DISEASE OF LUNGS.		ALL CAUSES.		BIRTHS.		EXCESS OF BIRTHS OVER DEATHS.	
No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
16	2·86	13	2·32	148	26	489	88	509	91	20	—
9	1·87	22	4·58	110	23	370	77	442	92	72	—
7	—	26	—	13	—	315	—	220	—	95	—
28	5·	11	1·91	53	9	454	79	485	84	31	—
25	3·52	15	2·11	138	19	515	72	727	102	212	—
7	2·8	5	2·	2	·8	152	61	203	81	51	—
7	1·55	8	1·8	75	17	291	64	368	81	77	—
13	1·82	21	2·94	140	20	538	75	769	108	231	—
7	3·18	8	3·63	38	17	162	74	250	114	88	—
19	2·82	129	3·06	717	17	3,286	78	3,973	94	687	—

with the Registrar's Quarter. The Rate is for every 10,000 of the population.

MANCHESTER AND SALFORD

MORTALITY RETURN FOR

DISTRICTS.		POPULATION, 1863.	SMALL-POX.		MEASLES.		WHOOPING-COUGH.		SCARLATINA	
			No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
MANCHESTER.	Ancoats …………	56,191	29	5·18	59	10·53	52	9·3	279	50
	St. George's………	48,294	25	5·21	41	8·54	53	11·	141	29
	Market-street, 1861	23,523	19	—	6	—	20	—	37	—
	London-road and Deansgate ……	57,633	13	2·25	64	11·11	38	6·6	253	44
Salford ………………		71,258	30	4·22	66	9·3	87	12·25	122	17
Pendleton, &c…………		25,160	5	2·	26	10·4	6	2·4	48	19
Chorlton………………		45,140	10	2·22	24	5·33	29	6·44	151	33
Hulme, &c……………		71,461	24	3·36	48	6·72	57	8·	263	37
Ardwick ………………		22,124	11	5·	27	12·28	13	6·	81	37
TOTAL ……………		420,784	166	3·94	361	8·58	355	8·44	1375	33

This Year is compiled from the Weekly Returns, and consequently will not cor

SANITARY ASSOCIATION.

YEAR ENDING 1863.

Diarrhœa.		Fever.		Disease of Lungs.		All Causes.		Births.		Excess of Births over Deaths.	
No.	Rate.	No.	Rate.	No.	Rate.	No	Rate.	No.	Rate.	No.	Rate.
129	23	49	8·75	561	100	1900	340	2172	388	272	48
102	21	47	9·8	357	74	1433	298	1884	391	451	93
47	—	60	—	45	—	1332	—	899	—	433	—
169	29	49	8·52	211	37	1849	321	2039	354	190	33
189	27	60	8·45	538	76	2119	298	2961	417	842	119
33	13	20	8·	2	·8	584	234	956	382	372	148
49	11	28	6·22	310	69	1100	244	1510	335	410	91
91	13	57	8·	552	77	2068	288	3062	428	994	140
39	18	29	13·	173	80	673	306	1016	462	343	156
848	21	399	9·5	2749	65	13058	310	16499	392	3441	82

d with the Registrar's Year. The Rate is for every 10,000 of the population.